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A LOOK AT ALGERIA AND TUNIS.

BY

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To open this paper with a confession:—I went to Algeria for a stepping-stone to Spain, to trace the progress of Arab civilization, or rather the progression of that flood of Arabians that overflowed Egypt and North Africa and thence all Spain, to and beyond the Pyrenees a thousand years ago.

In the following sequence, somewhat we may trace it: Damascus, Cairo, Carthage, Algeria, Tangier, Andaluz. And in Andaluz in Southern Spain, do we not find Granada, Seville, Cordova, Cadiz, Palos? Cadiz and Palos, whence Columbus sailed to America.

Africa and Spain, then, do they not furnish us with the prefatory pages of America's history?

No, I do not deny the Norsemen anything; I say merely, it is a feeble glimmer the North Star gives us, as compared with the steady ray from the Star of the East.

I woke one morning in Algiers. It was a bright cool and windy morning, that of the twentieth of March.

Though early, a large proportion of the population seemed to be astir, and I had company everywhere, yet not an obtrusive company. The population of Algiers, Arab, Moor, Nubian, French, etc., is thoroughly cosmopolitan ; it manifests no surprise at anything, and this, I take it, is owing to its own heterogeneity, for there never was, certainly, anything more unique than itself. In one word : as to situation, as to composition, as to surroundings, Algiers is most beautiful. Its beauty is of the Oriental type, with an intrusion from France. The French structures, which are mainly along the quays and in the lower part of the town, are of themselves fine and even grand, but they spoil the picture of Algiers from the sea by breaking the continuity of the converging lines that lead up the hill-side from the water edge. In general outline this city is an isosceles triangle resting against a background of red and verdure-clad hills. Not inaptly, the ancient Arabs compared it to a diamond with an emerald setting. A milky opal it seemed to me, with its iridescence clouded over, for the walls and roof are creamy hued, and from a little distance blend most beautifully with the surroundings. The general slope of the Sahel or chain of hills behind and extending beyond the city, is toward the south and east. From the blue waters of the deep bay, the city mounts the hill in a succession of terraces line above line, the modern French houses near the water line, the true Arab city higher up, and the apex of the pyramid crowned by the Kasba or ancient citadel of the Beys, some 400 feet above the quays. Since the French occupation, now some fifty years past, the modern buildings above the entire waterfront have been erected. The most magnificent work

here seems to be along the quays, a series of arches rising some forty feet above the water line, in two tiers, covering an area of eleven acres, with a frontage of 3700 feet, and occupied as warehouses and storerooms, some 350 in number. This great work was the achievement of Sir Morton Peto ; it cost some £300,000, and was completed about twenty years ago. This system of arches supports the grand avenue formerly called the "Boulevard de l'Impératrice" but now the "Boulevard de la République." As it overlooks the enclosed harbor, the beautiful bay and the shipping and gives glimpses of the Atlas Mountains beyond, this boulevard is the favorite promenade of an afternoon and evening, and is densely crowded. The finest buildings, six to eight stories in height, front towards this boulevard and the bay, and the best hotels are here, nearly all with a line of arcades. All the buildings of the city are of stone, massive structures, many with white or tinted walls and roofs of tiles. There is no structure in the world that lends itself so perfectly to become a component part of the landscape as the stone-walled building with roof of richly tinted tiles. I wonder why we do not use this kind more in America.

An unbroken line of fortification surrounds the city, beginning at either end of the boulevard, running up the hills behind it and crowning the crest, a high wall, loop-holed, battlemented and buttressed by occasional forts. Two great jetties sweep around from north and south and enclose a sheltered harbor, 222 acres in area, with a depth of 40 feet, and a width of entrance something over 1000 feet. The breakwater was begun in 1836, and is said to have been the first experiment in constructing

works of this kind with blocks of concrete. It was a successful experiment, and, even though some of the great blocks have been undermined and broken down, the enclosed harbor is perfectly sheltered. Beacons at either extremity, one showing a green and the other a red light, guide the mariner into the harbor at night. All this was a modern work; but there had existed, previous to the coming of the French, a small harbor protected by a mole. This was constructed in 1518 by the first of the pirate Deys who made the name of Algiers such a terror to followers of the sea. Not only are the remains of this still seen, but even the light-house built in 1544 yet stands. It is octagonal in shape, one hundred and twenty feet high, and displays a fixed white light visible fifteen miles at sea. This light-house of the pirates is built upon the remains of a fort the Spaniards erected and held for many years, called by them Fort Peñon. The fortification, as already mentioned, begins at the breakwater on either side and entirely encloses not alone the city but the hill upon which it is built. A great wall was built from the sea to the Kasba in 1540 by one of the pashas, and in 1581 the fort at the eastern end of the Boulevard de la République, known as the Fort Bab-Azzoun. The present line of environment consists of a high rampart, parapet and ditch, with here and there bastions stretching around from sea to sea. To the north is the city gate of Bab-el Oued, to the south the gate of Bab-Azzoun.

My room at the hotel faced the the sea, and was at a height sufficient to give me glimpses of a great deal beyond the bay. Such sunrises as I saw from my little room were of the kind to live in memory forever. I

always retired with the *jalousies* drawn aside, so that the first morning beams should apprise me of the coming sun. Then I would lie against my pillows in ecstasy, watching in wonder the beginning of another day. First the mists on the Mediterranean would dissolve and roll upward, disclosing white, pointed sails against the blue, then the snow peaks of the distant Atlas became slowly tinged with pink, deepening to crimson and then glowing like burnished gold, as the great red orb lifted itself above their crests. Fleecy clouds hung about the horizon for an hour or so, then disappeared, as the sun fairly entered upon his daily journey across a cloudless sky. The noises on the quay and in the street below increased as the hours went by, dying away at noon, but swelling to a perfect uproar late in the afternoon and early in the evening. Then, from dusk till midnight, the Frenchmen are in their glory. They swarm the streets, promenade the avenue, gather in groups around the tables on the walks and squares, chatter incessantly, shout, sing, and fill the air with music. Wherever the Frenchman goes, there goes a bit of Paris. He is always aggressively happy, always seems determined that the world shall see what a blithe and light-hearted creature he can be. The grand promenade is along the Boulevard de la République, above the quays, beneath the corridors of the great hotels and around the Place du Gouvernement. These wide French streets and boulevards are the cleanest and most pleasant thoroughfares, but the narrow lanes that branch out from them and climb the hill are, by far, the dirtiest and most interesting. Such are the Rue de la Kasba, the Rues Kléber, Ben Ali, and de la Mer Rouge. In

the Rue de la Mer Rouge one may ascend by steps, 500 in number, and, of course, no carriage can enter. But the steepness and the steps offer no obstacle to the donkeys, that crowd you against the walls at unexpected corners and act as though they owned the entire alley. Cautiously threading your way along and up this tortuous street, you have glimpses of the Orient that will repay all your exertion ; of Arab dens, swarms of half-naked children, rows of Arab shoes with their heels chopped off, peeps into dimly-lighted dens, from the obscurity of which gleam out wolfishly the eyes of masculine Arabs, while a more tender light may at rare intervals gladden you from the orbs of some Moorish damsel. If we climb high enough, we shall reach certain corners where we can look back over the roofs, and out through the rift in the walls, to the shining sea beyond. Climbing yet higher, we reach the Kasba or citadel, the ancient palace of the Deys, the foundations of which were begun in 1506. It caps the summit of the hill, the apex of the shining triangle of white houses and mosques lying against the Sahel. A fine mosque and minaret stand near and ornamental tiles are yet to be seen in place, suggestive of former elegance. Here dwelt those semi-savage Turks and Moors, whose barbarities held Christendom in awe for several centuries. In the centre of the Place du Gouvernement is the fine equestrian statue of the Duke d'Orléans, and on one side a large mosque, with a square minaret, about ninety feet high, in which is a clock. A more ancient mosque, said to have been erected in the eleventh century, is the *Djamaa el Kebir*, in the Rue de la Marine, very near to the other. Its interior is like that of all mosques,

with massive columns supporting the roof upon Moorish arches. Coarse matting covers the floor and protects it from the foot of the unbeliever. You may enter any mosque in Algiers if you take off your shoes and carry them in your hands. You may keep on your hat, but you *must* take off your shoes. At the entrance to every mosque, or in the court, is a fountain where the Moslems wash their feet before entering the holy place. A few lamps are hung here, and the only other objects to attract attention are the *Mimbar*, or pulpit, and the *Mihrab*, or holy niche towards Mecca.

More than a hundred mosques are said to have stood in Algiers previous to the French invasion, but doubtless many of them were merely *koubas*, or the tombs of Arab saints. These may be seen dotting every hill crest in the country, and occupying nearly every prominent situation in Algiers. The finest is that of Sidi Abd-er-Rahman, above the garden Marengo. The saint died in 1471, and his beautiful mausoleum is hung with the richest silk drapery, banners, lamps, and ostrich eggs. The cemetery in front and around it is charming, in its quaintest tombs and headstones, where rest the ashes of many Mahometan rulers, the latest interred there being the Dey of Constantine. Below this enclosed cemetery lies an attractive spot, the garden Marengo, where many strange plants flourish, where serpentine walks lead to glorious outlooks over the sea, and where coolness and shade ever invite the traveller to rest. In its centre stands an ornamental kiosk decorated with fanciful tiles. Speaking of religious edifices, we should not neglect the French Cathedral, in the Place Malakoff, built on the site of the Mosque of

Hassan. A broad flight of twenty-three steps leads to the entrance, within the portico, with its four black-veined marble columns. More conspicuous, both from its position and its architecture, is the famous church of Our Lady of Africa—Notre Dame d'Afrique—perched upon a commanding promontory a short distance beyond the Bad el Oued, or northern gate. It is a grand structure in the Romano-Byzantine style. This may be called the church of the sailors, as here are said masses especially for those lost at sea. To the brow of the promontory, every Sunday, the clergy march in procession, and perform funeral ceremonies above the vast grave of the sea yawning at their feet. Out in this direction and above the city, the views from the hill-tops are beautiful. Leaving the city by the southern gate, at several kilometres distance we find a delightful garden of all sorts of tropical plants and trees, called the Jardin d'Essai. On the way we pass the broad parade ground where the soldiers manœuvre and where the Arabs camp with their camels.

Above this is an Arab cemetery, which is much frequented on Fridays by the Moorish women. It contains the sacred tomb or *kouba* of Sidi Mohammed Ben Abd-er-Rhaman bou Kouberain, or the man with two tombs. The most attractive district of Algiers is that beyond the Porte d'Isly, called Mustafa Supérieur, where the houses of the European residents are mostly built and where the numerous villas, many of them in Moorish style, stand among gardens. Here the summer palace of the Governor General is built, thoroughly Oriental in its architecture and tropical in its surroundings.

On my first trip to Mustafa Supérieur I met in the

omnibus the British Consul General Sir Lambert Playfair, the author of the "Guide to Algeria" and of various books on Africa and the Mediterranean. He insisted that I should go with him to his house.

Sir Lambert is a brother of Sir Lyon Playfair. He has lived twenty years and more in India and Africa, and is ever active and alert. I was much interested in some mosaics he was making with his own hand from native marbles of Algeria; and as we had common topics of interest in birds and flowers, we talked till nearly dark, and I went away with a delightful impression of British culture and hospitality. Sir Lambert declares the views from Mustafa Supérieur to be second to but one on the Mediterranean, and as I stood at his windows and in his garden, and wended my way down the winding road to the city, with views combined of land and sea, framed in tropical vegetation, I was inclined to think with him that this was one of the favored countries of the earth.

FRENCH PROGRESS IN ALGERIA.

If anything be needed to illustrate French push and progress, and their fitness for successful colonization, it is to be found in their manner of road and railway construction. The French are the Romans of to-day, in the matter of road making. From every seaport and from every important city in Algeria roads and railways ramify in every direction, and are all trending toward the great and mysterious interior region known as the Desert. But, as they push further and further southward, the Great Desert vanishes before them, and is only heard of when the locust clouds come up and the scorching siroccos

sweep along the plains. More than fifteen hundred miles of railroad are now built in Algeria, or rather along the north coast of Africa. The various lines form one vast system, so that the traveller can enter Africa at Oran and journey clear through to Tunis. And these roads are well built, stone ballasted, with massive viaducts and gentle gradients; though the rolling stock consists of those hideous cars and wagons we see in France and Spain. The distance from Oran to Algiers is 421 kilometres, and the first-class fare is 48 francs; from Algiers to Constantine, 464 kilometres; from Constantine (or Kroubs) to Tunis, 450 kilometres, the whole distance being 1335 kilometres, or about 850 miles. The various branch lines extend from near Oran to Tlemcen and to Mascara; from Phillippeville and Constantine to Batna, El Kantara and Biskra, and one projected from the Port of Bone, and the main line to the Gulf of Gabes. Nowhere in the world does it seem to me is there such a magnificent opportunity for development and civilization as in Africa, and especially in that portion now controlled by the French. The French, as colonizers, are better than the English to deal with barbarous peoples. Before the Anglo-Saxons, barbarians and semi-civilized peoples melt away like snow before the sun. With the French, however, the case is different. They never exterminate, but assimilate. They certainly have very tough subjects in the stern and sullen Arabs, who hold themselves aloof in lofty scorn of the Europeans; but the French success with the Arabs of the cities, and even with the Jews and the Berbers, is evident.

The French have moved along several lines of pro-

gression and conquest. They have steadily advanced and held everything they have gained. In going from Algiers to Constantine you have a taste of North African quality in the great variety of scene and the glimpses into history afforded by towns along the line.

Though much of the route is monotonous, yet there are grand mountains, gloomy gorges and ravines where yet lurk the lion and the panther. Such gorges are the Portes de Fer, near the station of Sidi Brahein. Many of the towns have mournful memories of the native revolt of 1871, such as that of Palestro, a village 77 kilometres from Algiers, whose population of Tyrolese, French and Spanish immigrants was massacred in a manner peculiarly atrocious. At 294 kilometres from Algiers we reach Sétif, a very ancient city and a flourishing colony in the Middle Ages.

Not far from the station of Telegma, about 40 kilometres from Constantine, the most beautiful remains of Roman art in Africa were discovered in 1878. The mosaic floors are supposed to be of the first or second century and represent domestic and hunting scenes, with great beauty and fidelity.

The objective point of this long railroad ride is the famous city of Constantine, declared to be the most picturesque, as to its natural situation, in the world. It covers the summit-platform of a rock plateau, square in shape, with perpendicular sides rising nearly 1000 feet in places above the river Rummel, which flows around it on the north and east. This river, flowing through its cañon walls, is spanned by four natural bridges of rock, one of which supports the bridge by which the city is

reached, El Kantara. Constantine, formerly Cirta, was a sister city of Carthage, and the capital of Numidia. The name was changed to Constantine, about the year 313. It is a city celebrated in ecclesiastical history, also, and connected with the great St. Augustine and the early Christian bishops of Africa. Relics of Romans, churchmen, Arabs, Vandals are found here on every side. The last of the Deys here built a magnificent palace, that the world may well come to now and gaze at in wonder. Monuments with Latin inscriptions may be found on every hand, and a Roman aqueduct, repaired, brings water to the city. From Constantine, or, rather, from the port of Philippeville north of it, a railroad passes southwardly into the desert. At present you can go no further than Biskra, 230 kilometres, whence roads or trails branch out into the unknown. From Batna, about midway, we may reach the little known Aurès Mountains, where reside people supposed to be descendants of Romans, Byzantines and Vandals, and whose women are said to be among the most beautiful in the world.

About half way between Batna and Biskra is the great gorge El Kantara, so called from a famous Roman bridge seen here. The scenery here is very picturesque, mountain and desert scenes blended, and a forest of date palms marks, it is said, the northern limit of the desert fruit. For oases, we must push on to Biskra, the terminus of the railroad projection in this direction. Biskra is a charming desert town, composed mainly of mud buildings, with a great grove near and around it. The oasis of Biskra is said to contain 100,000 palm trees, and as it is abundantly supplied with water from running streams

and artesian wells, it has smiling fields and luxuriant gardens. Its climate is tropical, except during the winter months, and the air is pure and dry. It has been a favorite subject with the French writers on Algeria. Biskra is the northernmost of that archipelago of oases that lies across the great sea of the desert. From the mountain range south of Batna you gain your first glimpses of this sea of sand, a vast plain, sweeping away and away. It is like the ocean, boundless, save for the horizon's brim; the image of the ocean with its isles and islets. This vast plain without limit, and unsurveyed, is the Sahara, and like the ocean it is constantly encroaching upon the fertile land, sweeping its sand billows upon the foot-hills of the mountains and sending its sand-storms flying over the Tell and the Metidja, even to the Mediterranean. Storms and hurricanes sweep over this vast plain as over the ocean; its oases are the resorts of predatory Bedouins and of caravans, even as the palm islands of the Pacific are lairs for pirates and havens of rest for storm-tossed fleets. Nothing in nature, perhaps, can present so dreary an aspect as the plains of the Sahara, except the fire-scathed crater of a volcano; and nothing so welcome to the traveller and the caravan as the green oasis. There are three generally accepted divisions of the N. African land: First, the littoral strip of territory called Tell, consisting of fairly fertile cultivated land extending from the coasts to the mountains, and the high plateau, and varying from fifty to one hundred miles in width. The Atlas Mountains cross the territory with a general trend from north-west to south-east: from Cape Nun, on the Atlantic, to Tunis, on the Mediterranean. They approach within thirty miles of the city of Algiers, and between their lateral

ridges are fertile valleys, like the Metidja. South of the mountains and plateau begins the Sahara, which may occupy as vast a territory as the geographers will admit; and beyond this lie the oases, the third division. In most of the oases the palm groves are planted many feet below the surface of the desert, in the water-bearing sand beneath the surface-crust of gypsum. Thus, a mound of verdure may sometimes be seen rising dome-shaped above the sands, without any visible trunks to the trees.

Twelve or fifteen miles from Biskra is Okba. Here also are beautiful oases, and here is probably the "oldest Mahometan Monument in Africa," the mosque of Sidi Okba, an Arabian warrior who is said to have conquered this country in the sixtieth year of the Hegira, and this memorial mosque is dated from early years of the eighth century. It is about one hundred feet long, this primitive building, and from its minaret is a most charming view of the surrounding country. An inscription here, in Cufic characters, is said to be "perhaps the oldest Arabian inscription in the world," and reads: "This is the tomb of Okba, son of Nafa, May God have mercy on his soul." He and some 300 of his men were massacred here by the Berbers in the year of our era 822.

Tunisia, the latest acquisition of the French in North Africa is a natural continuation of Algeria. The city of Tunis occupies a position between the lakes or lagoons, while the ancient Carthage was nearer the open gulf. Of the modern city an English artist writes: "No words can do it justice. The great bay is almost land locked; billowy peaks to the east; in the dim distance the blue hills of the Zaghouan range, the mountains that look down upon the far-famed city of Kair-

wan ; directly in front the white houses of the Goletta—the present harbor of Tunis ; away to the westward the stony amphitheatre, rich with the memories of 2000 years, where once stood Carthage, the very spot from which Dido looked with longing eyes upon the white sails of her hero-lover as they floated over this lonely bay. Everywhere there are fine hills in graceful outline sweeping down to the blue waters of the gulf, and everywhere strange tropical trees, lofty date palms, and straggling prickly pears. I know of no city except Constantinople that occupies a site which can be compared with this. Even that of Ephesus is inferior in splendor, if not in interest. The great city occupied an amphitheatre sloping gently down to the edge of the gulf." Such was the situation at Carthage. "The impression to-day is one of intense disappointment. The Roman wish has been fulfilled, and of the once glorious Carthage not one stone remains standing above ground." "The whole site of the city is strewn with broken fragments of pottery, mosaics, sculpture, marbles, pillars, tiles. Everywhere, too, huge fallen masses of masonry are lying prone upon the earth. The site of Dido's palace is shown, and beyond the extensive cisterns, vast subterranean structures with heavy vaulted roofs. In every case the masonry is of the most substantial character, showing how well the Phœnicians did their work."

There is here a rich field for excavation. "Three towns lie here atop each other, one Punic, one Roman, the last Byzantine." Tunis, now the chief city of this great gulf, "grew out of the ashes of the Roman colony, and received its autonomy only with Islam. The Arabs destroyed all evidences of Christian culture, overthrew

the temples, and with their fragments built their own mosques and palaces." Though Tunis has been declared more Oriental than the Orient, than even Cairo and Damascus, yet the inter-communication afforded by the railroad has robbed it somewhat of its distinctive character. Its bazaars may be more richly furnished than those of Algiers and Tlemcen, but they are substantially the same in character.

France has not been able to give much attention to the transformation of the people here; she has had too much to do in seeking to assure peace throughout the country.

The ethnographer finds the following elements in Algeria: (1) The true Berbers, (2) Arabianized Berbers, (3) the Arabs, (4) Algerians, (5) the Jews. As to the Koulouglis, or half-breeds, children of Turks and native women, and the negroes, they are so few as scarcely to merit special mention. In round numbers, there may be 1,000,000 Berbers, 1,500,000 Arab-Berbers, 500,000 Arabs, 500,000 Europeans, including the Algerians, and 35,000 Jews. Most of the negroes from the Soudan are found in the oases.

The dark type of the primitive population greatly resembles the Arab type, their distinctive features being less accentuated in the Arab-Berbers. Among the Berbers the bones of the skull are excessively hard and thick, and the children of their own accord practise striking the hardest object with their heads. All natives wear the beard, though the head is completely shaven, with the exception of a tuft of hair on the very top. The members of certain brotherhoods often let this tuft grow until they can braid it.

It is impossible to trace, even approximately, the physical characteristics of the new Algerian race, whose existence has but just commenced. The Berbers of the mountains inhabit houses grouped together in small villages on peaks and hill-crests difficult of access. Their domestic animals live under the same roof, separated from the family by a low wall. The Berber costume consists of a long shirt, over which is the burnoose, the legs, arms and the top of the head being bare. The women's costume consists simply of a woollen, shirt-like garment, belted around the waist. A handkerchief around the head, immense ear-rings, a necklace, bracelets and anklets complete the attire. Men and women wear their clothes till they fall to pieces. There is little variety in their food, their most common dish being the *couscous*, or lumps of flour cooked with the steam from the broth of the meat, and strongly seasoned with butter or oil; add to this various fruits, such as dried grapes and figs, artichokes, beans and peas. The Arab-Berbers live sometimes in *gourbis*, or huts of branches, sometimes in tents made of camel's hair. Each hut or tent shelters an entire family. A group of huts is called a *dechera*, or hamlet; if composed of tents, it takes the name of *douar*. They wear the costume of the Berbers, and in addition, sometimes, the *haik*, a long piece of very light cloth, first wrapped around the body, then brought around the head, where it is kept in place by a camel's hair cord. On great occasions the horsemen wear riding-boots of red leather. All the Arabs live in tents, and are nomadic. Their food consists of *couscous* of wheat or barley, and the various fruits, especially dates of the desert, of which they are extremely fond,

mutton when they can get it, and milk. They are very frugal, and more temperate than other natives.

The city dwellers have adopted a more complicated costume, consisting of bulgy trousers, a broad red belt of wool or silk, a close waistcoat, and a jacket of cloth or silk. On the feet shoes without heels, or with quarters turned in; on the head two caps, one of cotton, the other of red wool, placed over the first; over the shoulders a light burnoose. The native women in the towns are often as light as European brunettes, losing the dark color they had in the country; and this change is so marked that one would be likely to consider them a separate race. They lead a more comfortable life than the country women, and even if they are deprived of the privilege of going out with uncovered faces, they find some compensation for this in dressing more coquettishly. Their costume differs from that of the men only by its elegance; the belt is more graceful, the jacket of richer material, the coarse shirt of the men is replaced by a garment of gauze, and the scanty waistcoat forms a bodice open at the throat. The *coiffure* alone is entirely different; the hair is brought to the top of the head, and around it is twisted a fringed silk handkerchief. The young girls braid their hair into one long plait and wear a sort of velvet cap adorned with sequins. Out-of-doors the women wear a little veil, which hides all the face below the eyes, while a large piece of cloth falls around the body, hiding its general shape. The most elegant houses differ little in furnishing from the tent; carpets, mats and small mattresses serve as seats during the day and as beds at night. The jewels and gala dresses are piled up in

trunks of native wood. Among the poor the meals are served on the ground ; among the rich on a copper tray placed on a very low and small table.

All eat out of the same dish ; the solid food is taken with the fingers, the liquid with wooden spoons. The men are served first, while the women eat by themselves what is left. Politeness demands that the host, no matter what his rank may be, should himself serve the guest ; he first tastes the dishes before presenting them ; he points out the best morsels to his guests, and if the latter hesitates to take them puts them into his mouth. When the *douar* receives a distinguished guest the repast is furnished by the whole community. The inhabitants of the *douar* then arrange themselves around the guest in a series of concentric circles, graduated by rank. Each dish, after having been tasted by the guest, is served successively to the different circles, and the bones, carefully gnawed, are finally given to the dogs, silent, though expectantly watching the proceedings from the outermost circle. All natives have an abiding faith in amulets as a means of preserving health. These amulets are small scraps of paper on which are traced a few cabalistic signs and words from the Koran. The natives of the town are more given to ablution than the Arabs, these latter being extremely filthy. The children of all the Algerian races are extremely precocious and very intelligent, but their development is early arrested and the intellectual faculties weaken rapidly.

The inferior condition of the native women, which aids in the transmission by heredity of many faults, plays an important part in the tendency to degeneracy. They rarely are acquainted with anything beyond their

own *douar* and their intelligence concentrates itself on a restricted circle of vulgar ideas. The men never condescend to converse with the women, and these are forbidden to talk with strangers. Universal ignorance prevails, except that every little community is likely to have its *thaleb* or scholar learned enough to read a little of the Koran. The Moslem religion is far from being in a pure state in Algeria. There is no tribe but has its favorite saint, to the tomb of which the people repair constantly to pray. The body of the saint is sheltered by a domed chapel, called *koubba*, which has in the middle a catafalque covered with silk and brocaded stuffs, and on the walls banners of silk and offerings. Sometimes the *koubbas* merely cover the spot where a saint has passed the night. The natives are very superstitious and fear the evil eye, not only for themselves but for their cattle. The numerous idiots met with are objects of great attention because they are supposed to be possessed of a devil whom it is prudent to propitiate. As a rule the farther you go towards the desert, the purer is the Arabic spoken by the people. The Algerians of course speak French, and generally without the slightest accent.

The native Jews speak among themselves a corrupted Arabic with which are mixed a considerable number of French words with Arabic inflections. In the province of Oran Spanish is generally spoken. In character the Berbers are revengeful, courageous, and honest among themselves, though rapidly learning the Arab vice of cheating the stranger. The social unit among the Berbers is the *kharrouaba* or members of one family, sometimes admitting others ; and sometimes families and

even villages unite in common interest, and thus a little republic may be formed. Each village is governed by an *Amin*, or sort of mayor, who is assisted by a few of the chief men of the village. The *djemaa* or municipal council, meets once a week to deliberate on the affairs of the community, all the males from the age of sixteen taking part. The Moslems here have no real clergy, and the Mufti is more a magistrate than a priest. The caste of the Marabouts has great religious influence, the quality of which is hereditary in the male line of all those who have led an exemplary life or who have consecrated themselves exclusively to the defence of Islamism against infidels. They used to live in convents. All do not know how to read, but to them is intrusted the education of the children. This education consists in teaching them a few prayers, some chapters of the Koran, which they learn by heart, and a little reading and writing. Even the very "learned" Marabouts never pass the line of instruction in European primary schools. Though polygamy is authorized by the Koran, the great majority of the Moslem population do not take advantage of it, simply because they cannot afford it, and for no other reason. The woman's position is practically that of a slave to her husband, and an ill treated one at that. Sabbatical rest is unknown to the Moslem; the Friday services, at which they are obliged to assist, last but an hour, and they can then employ the rest of the day in their usual labors. On the plains life is comparatively easy, seed time and harvest taking up about three months in the year, and the rest is spent in idleness. The cattle, sheep and horses require only to be led to fresh pasture, and are attended by the children. The

women make the *haïks* and *burnouses*, the chief articles of clothing for all. The men make the wooden part of their ploughs and plait baskets and ropes, which, with a two edged pick axe, made by a blacksmith, constitute their stock of agricultural tools. Earthen and wooden dishes, a pitcher and a kettle, comprise the kitchen and table utensils. The furniture consists of a few mats, a wooden chest, and sometimes a carpet. In the cities, industries are more active and diverse; there are found especially potters, dyers, armorers, blacksmiths, tinkers, carpenters, tanners and an incredible number of shoemakers; which seems surprising in a country where so many of the people go barefoot. Every Thursday the city women pass the afternoon at the Moorish baths, where they wear the most beautiful toilets. On Friday they go to the cemetery, less to pay regard to the dead than to take the air in perfect liberty. This seems a strange place for a reunion, but it is probably selected as less exposed to the gaze of strangers.

To-day all the tribes have lost the freedom they enjoyed under the Turks; the natives are directly governed by agents in the pay of France, and their laws are greatly simplified. They have preserved all the practices of their religion, and the rare attempts at proselytism, either by the Protestants or by Romanists, have been without result. The principal Arab settlements of those hordes who came here, driven by hunger, from the shores of the Red Sea, have been in the southern parts of the province of Oran (Tlemcen) and in Morocco. The nomadic life has such a charm for those who have tried it in their youth, that it is impossible to even think of drawing the Arabs of the high plateaux, or of the

Sahara region, from this mode of existence. They are like sailors, in their love of the monotony of vast expanses and solitude.

A passport is not necessary in Algiers, but you are required, at the hotels, to give those items of information about yourself that the police prize so highly. Then you are free to go and come at your leisure.

Of the various excursions in the neighborhood of the city, that to Blidah and the gorge of Chiffa is the most often recommended. At the former place are wild and rugged scenery, great rocks, and running streams, and troops of wild monkeys, that sometimes show themselves to tourists. The trip to Blidah I took on my way to Oran. The line first skirts the beautiful bay and then, at ten kilometres distance from the city, turns to the southwest and enters the Metidja, the plain of great fertility that lies between the Atlas foot-hills and the Sahel. Tall eucalyptus trees at times line the track and are seen in many groves. Tree planting on a vast scale has been undertaken in Algeria and with the most beneficial results; where formerly were sun-scorched desert, and sterile hillside, or damp miasmatic swamp-land, the beneficent eucalypti spread their limbs, filling the air with balsamic odors in place of miasm and giving shade and fertility. The town of Boufarik is an example of what European energy can accomplish in Africa, with its stream-bordered streets, shaded avenues and squares, where was once a swamp so malarious that the first settlers died like sheep. The native trees of value are the cork, cedar, ilex, the Aleppo and maritime pine, the olive, fig, the citrus family and the palms. But of all trees the Australian gum trees, the eucalypti, are the

most valuable in the *reboisement* of Algeria. That it is the determined purpose of the French to afforest the north coast of Africa is a fact that commands the approbation of the world. The Metidja is estimated to contain 500,000 acres of land, one-half which can be cultivated with success by irrigation by means of artesian wells and reservoirs. The cereals flourish, but it is in small fruits and vegetables that Algeria excels.

Other pursuits than agriculture draw hither many strangers, especially the pursuit of sport; but, if the farmer's rewards are meagre, so are the returns of the sportsman. The season for shooting lasts from September to February, and, as in France and all her colonial possessions, one must have a shooting license. Partridges, snipe, ducks and woodcock are sometimes found, but not in abundance. Yet there are many wild animals remaining in this country, where "Gerard the lion-killer" found such sport in his time. In the twelve years between 1873 and '84 there were killed above 30,000 wild animals, including 181 lions and 1,000 panthers. The rarest sport is that of falconry, which certain of the Arabs indulge in at the South. It is said that the art of training falcons is hereditary, and it requires great skill and patience. The hawks are snared and hooded and perched upon their master's shoulders, which are protected by strips of leather. They are fed only by their captor, and when they have become attached to him, after two months or so, they are taken to the field, hooded, and the hood removed only when the quarry is in sight, at which they fiercely dash.

It was a short run of 30 miles to Blidah, a town of

8,000 inhabitants. It lies at the base of the Atlas range, with the Metidja spread below to the Sahel beyond. An omnibus carried me to the hotel, where I found a neat room, a cool inner court overhung with vines, good meals and excellent service. I went first to see the *Bois Sacré*, the sacred grove of olives, in the suburbs of the town. These trees are sacred because they contain and shelter the *koubbas*, or mosque-like tombs of some Arab saints. They are indeed beautiful, these white and marble-like structures, with domed roofs; and the giant olives hung with trailing mosses rise above and enclose them in a twilight gloom that is conducive to thoughts of worship. Now and then the sun strikes through the canopy of foliage and draws a tracery of leaf and limb upon the marble surface of the tombs, painting these fleeting pictures all day long. Silent Arabs glide stealthily away emerging from the gloom, pausing a moment to pray perhaps, then disappearing again without a sound.

When I resumed my journey next morning I found the train crowded with excursionists, for the scientific men of all France had come to attend a meeting at Oran. They were true excursionists nevertheless, and all eager to get their money's worth as they went along. The infrequent towns along the line, as they are generally at a distance from the railroad, much resemble each other, and hardly any one is of conspicuous interest. Most of these towns are of recent growth, dating from the French invasion. The remains of the Arabs consist chiefly of the omnipresent *koubbas*, which gleam white on the hill-crests, or adorn some swelling elevation of the plain. We reached the station of Oran at

about eight o'clock in the evening. An unusual influx of strangers, owing to the assembling at Oran of the French Congress of the "Society for the Promotion of Science," promised to fill every hotel and *pension*. But I found a room at the Hôtel Continental, and there seemed to be accommodations sufficient for the 500 strangers attracted by the fêtes promised to the Scientific Congress. Bull fights and excursions, illuminations and native dances, all these were in store for the traveller who would remain; but I had come merely to learn the time of departure of the steamship for Spain. This information gained I was ready to leave next day for Tlemcen *via* the French-Arab village Ain-Temouchent. Several days later I returned and devoted four days to an examination of Oran. I found it more interesting than my previous view had promised. Not that I would recommend it as a place of resort either for health or pleasure, though a week might be passed there without loss of time or patience.

The city takes its name from the ravine (Wahran) behind it. It was the seaport of the kingdom of Tlemcen, and attracted many of the Moors who were driven out from Spain. At the beginning of the 16th century the corsairs of Oran had become so troublesome that Cardinal Ximenes fitted out two expeditions against the city. In the second, which he led in person, the city was taken and the citadel, supposed to be impregnable, was carried by storm. This *Kasba* is a vast fortification. The walls rise 40, 50 and in places perhaps 100 feet above the roadway; they throw out buttresses, project ornate sentry-boxes, and frown upon the steep ravines as well as directly upon the most thickly settled

portion of the city. In fact, one can hardly turn a corner without coming upon a fortress wall, a stone tower or vestige of some demolished castle. Many of the houses are built into and out of these ancient walls; the city is full of ruins and the suburbs are seamed with the lines of former military construction. The scars of sieges and earthquakes are mostly covered with vegetation, as every available plot of earth supports a garden overrunning with vines, fig trees and flowering plants. The Spaniards held the place for two centuries, lost it in 1708, retook it in 1732, and finally surrendered it in 1792; and the Algerines kept it till the French conquest in 1830.

No port of the Mediterranean, perhaps, can exceed Oran in picturesqueness. The town itself is built up the steep northern slope of the hill, the great ravine, Wahran, almost bisecting its upper portion, but filled in towards the sea and covered over with buildings. A thousand feet above the town rises the hill crowned by the fort of Santa Cruz; a little before it stands a Gothic chapel crowned by a colossal statue of the Virgin. The white figure seems to extend its blessings to those who have performed the work of suppressing here the religion of Mahomet. But, as if to mock this endeavor of the Christians to commemorate their achievement, the Arabs have erected a tomb to their patron saint of Oran, Sidi Kebir, on the crest of the ridge, several hundred feet above, and the white dome of this "*Marabout*" is visible further than the marble figure of the Virgin. And in the town beneath the great mosque of the Moors is as vigorously protected by the Government as the cathedral of the Catholics. One evening, an hour

before sunset, I climbed the steep road that leads to the fortress of Saint Grégoire, a few hundred feet below the chapel, and then clambered over the steep to the chapel and fort above. The ascent was so sharp that I could hardly maintain a foothold; yet up this mountain, more than once, had mail-clad soldiers dashed to the charge. I finally reached the fort only to find the entrance barred and the structure deserted. It rose above me stern and frowning, without a projecting scarp or abutment by which one might lay hold and climb to its parapet; yet this same fortress had been twice taken by assault; how, no one can now conceive. The only approach to it at all is along a knife-like crest on which you may sit astride, and even then there seems but slight hold for scaling ladders to be placed. How many must have perished ere the strong walls were taken; every crimson rock must have been drenched in the blood and the entire crest covered with the corpses of the slain. Beyond, across a deep gap in the ridge, there is a table-topped hill even higher where, on the edge of the precipice, is the white tomb of Sidi Kebir. From this dominating point the fortress could be bombarded, and doubtless the troops of Ximenes brought cannon here and first opened a breach in the walls before they pressed on to carry it by assault. The view from the chapel, fort or tomb is most magnificent. To the north the far-sweeping horizon line of the Mediterranean, east the harbor, and beyond a yellow coast crowned by the distant mountain of Kristel; from the base of the hill stretches the town, with creamy walls and roofs of sunburnt tiles, its surface broken by domes and minarets and the towers of church and cathedral.

At least eight forts, including the two on the hill, can be seen ; they guard every strategic point and thrust out their massive walls from every hill and angle of the wall. For this city is still surrounded by walls, with bastions and gates, and is guarded as in the time of the Turks and Moors. Beneath and towards the west a projecting promontory, some four miles from Oran, shelters a beautiful bay and quiet village. The point is strongly fortified and the fort of El Kébir, said to cover the site of one previously erected by the Romans, has undergone as many vicissitudes as that above Oran. Reminiscences of Spanish occupation are found here in the arms of Ferdinand over the fountain at the entrance, and on the shore of the bay towards Oran in some warm mineral baths known as *Les Bains de la Reine*, from the visit of Isabella early in the 16th century, with her infant daughters. An excellent road leads around the coast in this direction, leaving the fort beneath high cliffs, passing through a short tunnel, and all the way giving far-reaching views of the sea. The ravine and steep escarpment of the hill towards the town are thickly planted with pines so as to form a dense forest in refreshing contrast to the denuded rocks around. Some of the trees are a foot in diameter, and all are carefully tended under the oversight of the same wise Frenchmen who are looking to the future reclamation of these barren hillsides. By this means they have entirely changed the aspect of the scenery and added a new element of beauty to the view. Although the hills seem barren yet they are covered, as are the plains, with flowers of every hue, that spread out sheets of color here and nestle in sheltered places there, growing

out of crevices in the rocks and in the nooks and crannies of the fort. Perhaps the best place whence to view the castle-crowned hill is from the terrace or garden rising above the fort and planted everywhere with shrubs and flowers. Winding walks lead all about and through the branches of pines and date-palms gleams the red hillside with its yellow-walled forts. Some of the terraces are covered with a small vine bearing thick mats of flowers and are perfect sheets of purple bloom. Here also you look down upon the enclosed harbor, the scene of busy maritime life, where there are sometimes a dozen steamers moored and where a thick cluster of lateen rigged vessels occupies the inner quarter of the mole. Railway tracks lead out to the main station, a mile beyond, and thence run to Algiers, to Tunis, and far into the border land of the great desert. This port of Oran is at a time not far distant destined to be the great centre for an immense commerce with the interior of Africa perhaps, and certainly of Morocco. Oran has a museum with a well-arranged collection of marbles and mosaics, mostly obtained from towns to the north. These mosaics are all Roman, and some of them cover a surface of fifteen square feet and are of excellent workmanship. I have mentioned the mosque. Its minaret, detached from the main structure, is a conspicuous object in the centre of the town and is beautifully ornamented with border tiles. The main entrance of the mosque is handsome, but it is a restoration by a French artist and lacks the charm of antiquity. Nobody seemed to know where Tlemcen was when I made inquiry at Oran, but at last I was told to go to Aïn-Temouchent by rail and there take the diligence.

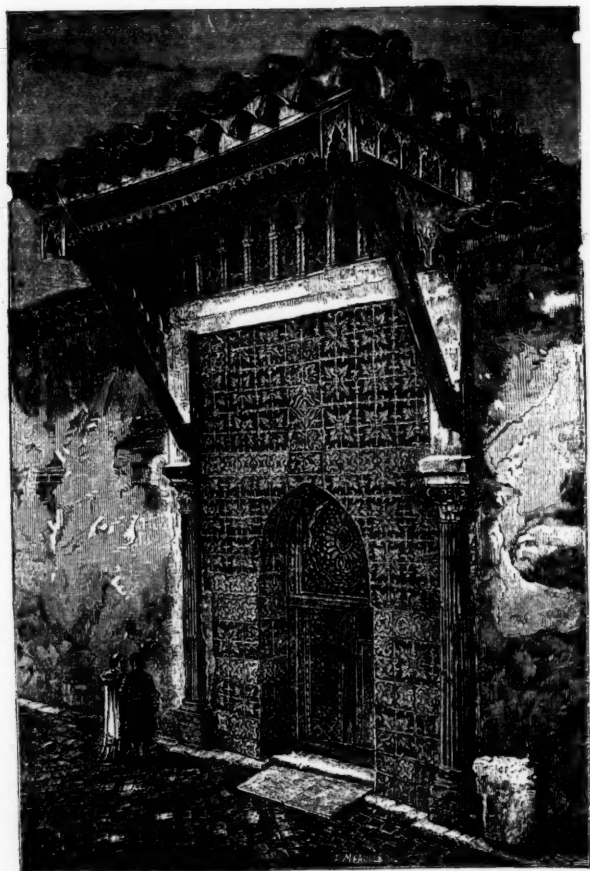
This I did. The roads were excellent and the scenery was interesting. To maintain this highway to Tlemcen in a perfect state, the road menders are stationed at intervals, who fill the ruts with broken rocks, and lay out long beds of this material, which the diligence must drive over because large rocks are laid on the smooth portion of the road. Our course, consequently, was a very sinuous one, as the driver had to veer from side to side to avoid the lines of rocks.

The first distinct sign of an approach to the desert was a group of Arab tents and a drove of camels. The camels were ranging the barren pasture land and seemed as much at home as cows in a field of clover.

Along in the afternoon we climbed the outermost brim of the valley in which Tlemcen was situated, and saw it before us, a fair city of mosques and minarets rising from leafy gardens.

Tlemcen is unique. It is a Moorish or Arab city, of ancient date, and with architectural monuments that remind one of the Alhambra. It was about 1,100 years ago that the Arab city was founded here, upon the ruins of what the Vandals had left of the Roman city Pomaria. During 400 years, Tlemcen enjoyed great prosperity. It was a great commercial centre and contained at one time, it is estimated, 5,000 Genoese, Catalan and Venetian merchants, who occupied a quarter by themselves. The city is surrounded by several lines of fortifications, for it has been many times besieged and taken.

I began a tour of the city with the great mosque, Djamaa-el-Kébir, in the Place d'Alger. It is not notable above even the mosque in the city of Algiers, though its court



GATE OF A MOSQUE, TLEMEN.

is paved with Algerian onyx, and the basin of its fountain is of the same material. It has seventy-two square columns and a beautiful *Mihrab*, or prayer niche, ornamented with arabesques. The minaret is about 100 feet high, and from its cupola I got a view of the city that rewarded me for all the journey. The mosque dates from 1136. Another mosque within the walls is now used as a schoolroom. This is the mosque of Sidi Ahmed Bel Hassan el Ghomari and its *mihrab* is decorated with arabesques as airy and delicate as any in the Alhambra. There are two other mosques with very beautiful minarets, just outside and below the western wall. The finer of the two is that of Sidi el Halani, or the sweet-meat maker, with a minaret decorated with mosaics and a great court with arabesques, and with columns of Algerian onyx. It has finely carved ceilings and is comparatively modern, being only about 500 years old. This mosque lies under the hill, and as you descend you can look down upon the minaret, and the court, and view the ground plan of the buildings. Upon the square top of the minaret, as upon that of every tower in the city is the huge bulk of a stork's nest with the great birds keeping guard. "Before the Arabian Conquest," wrote Mungo Park, "or about the middle of the seventh century, all the inhabitants of Africa, whether descendants from Numidians, Phœnicians, Carthaginians, Vandals, or Goths, were comprehended under the general name of Mauri, or Moors." All these nations were converted to the religion of Mahomet during the Arabian empire and among the first must have been the dwellers in this ancient city Tlemcen, for we find tombs of the saints over 1,000 years old.

About a mile from the city is the most venerated of them all, that of Sidi Bou Medina. Leaving the city by the gateway of Bou Medina, I went to the cemetery which was crowded with women, closely veiled, and gathered as usual in groups about the tombs, and especially around the square monument of Sidi Senousi, the founder of the sect of the Senousiya.

Some one has written : " Regarding the scene from a purely artistic point of view, we can imagine no more fitting subject for a painter than this group of Arabs at their devotion ; nature their temple, its altar the setting sun, their faces toward Mecca, their hearts towards the Prophet, their every attitude breathing devotion and faith." The cemetery is thickly set with graves, and one needs caution not to stumble over the numerous headstones, which are quaintly shaped and carved, and many of them picked out in colors, red, green or yellow. A solemn place this, and conducive to reflection, with its many memorials of the dead and its venerable olive trees. It should be seen by moonlight, however, to be most effective ; then indeed does it suggest an unreal city by the banks of the quiet river. Beyond the graveyard is the mosque of Sidi Bou Medina, entered by a narrow way, sometimes closed by doors of bronze, doors of such exquisite workmanship as to suggest the highest art. The pattern is an interlaced geometric figure and they recalled to me the bronze doors of the mosque of Cordova. The decoration of the mosque is good, but much is modern and its effect is somewhat tawdry. Stepping down, below the level of the court, we enter the *Koubba*, or tomb, of the saint of Tlemcen. This tomb is approached through a small court, in which is a well

with a curbing of stone which has been deeply worn by the use of 700 years. An old Arab sat here, guarding the sacred place from unbelievers who should venture to approach with irreverent feet. The interior of the tomb is hung with silken draperies, banners that are said to have been taken in Spain, ostrich eggs and other offerings of the sons of the desert. In one corner is an object seemingly incongruous, and that is a grandfather's clock. How many years it has ticked away the time in that ancient tomb, no one knows. Directly in front of the entrance way to the outer court, rises that of the mosque itself, ornamented with mosaic tiles made in Morocco. Everywhere, even in this most sacred place of the Arabs, I was treated with respect, and received with a grave courtesy that would have repelled the idea of a fee—had it not been for the ever extended palm. Sidi Bou Medina has a delightful situation, and the surrounding Arab village, though dirty, yet is charming in little stone houses and walled vineyards and gardens. On our way back, we made a *detour* that took in another holy *Koubba* in a delightful cemetery, that of Sidi-Yakoub, which is of the general shape and symmetry of the tombs of Blidah, in the sacred olive grove. Not far from this is the great minaret of the Aghadir, a mosque long since destroyed, and which is over 1,000 years old. All about the plains and slopes this side of Tlemcen are the ruins of walls, towers and minarets. Three circles of fortifications can yet be made out, surrounding the city. That afternoon we went out exploring in a different quarter and came upon an open field, gay with scarlet poppies and dotted with knotted old olive trees. Climbing away beyond, the pathway led up the cliff, several hundred feet

high, and after much difficulty I reached a plateau above. Here I found another *koubba*, placed upon the verge of the cliff, and visible from afar.

The view from the *koubba* is magnificent, taking in the whole valley in which Tlemcen is built, the mountains of Morocco beyond, and a faint glimmer of the distant sea. Down the face of this cliff fall two sparkling streams, one towards Tlemcen, and the other towards Mansoura. Mansoura is another city, a city that has perished all but its walls. During one of the long sieges of Tlemcen, nearly 600 years ago, the chief in command turned his military camp into a city by building around it a wall forty feet high, enclosing about 250 acres. At points, about 100 feet apart, high towers were erected, battlemented and pierced. From the plateau I counted eighty towers yet remaining. It was a beautiful scene, that broad plain bounded by hills, in its centre the twin cities, Tlemcen and Mansoura, the one living, the other dead. High above the walls and towers rises the great minaret of the mosque Abou Yakoub commanded to be built. It is about 120 feet high and is called "by far the most beautiful monument of Moorish times in Algeria." It is half in ruins, but has been strengthened by the French. It resembles the great tower of Seville, the Giralda, and, like that tower, is ascended by a series of ramps, instead of stairs, so that a horseman might ride to the summit. Were this the only monument here, tourists would come to view it. As to its color an artist writes: "Photographs may help you a little to imagine the place; but, having looked at them you must shut your eyes and color minaret and walls with richest, reddest ochre; you must

clothe the hills in living green, fill the space between hill and sky with soft warm skies of southern blue, and then set the whole picture floating and palpitating in golden mists. This minaret is unlike anything else in the world. It is like a gigantic monolith of solid Indian gold, and is as wonderful as the pyramids."

I returned to the city through the Fez gate. The air was pure and bracing, under the hot sun, and filled with flower perfume and the hum of bees. "It had been one of those celestial days when heaven and earth meet and adorn each other; it seemed a poverty that we could only spend it once."

I went to the market, one of the primitive kind, where vegetables were found in one corner, meat in another, and articles of domestic manufacture in another. All the marketing is done in the morning, and by noon the place is swept and garnished for health's sake; for these Arabs are now under French rule, and can no longer sit all day in the sun and fester and emit evil odors. But the most interesting of all is the Arab quarter, where the streets are narrow, where the shopkeepers sit all day in little dens about eight by ten feet square, each one with different articles for sale. Here we see the handicraftsmen at work; the shoemakers who make those wondrous slippers without heels, of gorgeous red and yellow, ornamented with gold and silver braid, and the tailor, whose duties are not very arduous, as all his costumes are of the same pattern. It is thoroughly Oriental and yet African. In these dens you find groups of gentlemanly Arabs, who are glad to have you join them in a cup of coffee and help them "at doing nothing all day in a row." Every

street has a minaret terminating it or rising at one side, and upon the summit surface of every minaret is a bulky nest, the home of the solemn storks. I sat on the hotel roof one night and watched a stork outlined against the amber sky, and the moon came out and lit up the narrow streets through which noiselessly walked hooded and sheeted Arabs, like a crowd of ghosts. It was my last picture of Tlemcen.

THE HITTITES.

BY THE

REV. LYSANDER DICKERMAN.

Attention is called to the story of a nation, every one of whose monuments, till recently, was buried and forgotten, or else regarded as unworthy of notice. During the last few years, time worn and weather-beaten statues, reliefs and sculptures have borne unexpected testimony to an originality in architecture and art ; while the records of contemporaneous nations have told us of successes in warfare, of familiarity with diplomacy and science, which prove the existence of an ancient factor in promoting civilization not hitherto recognized. We have just begun to trace the footsteps of a people, confined within no narrow bounds, whose numerous allies, whose acknowledged valor, and whose acquaintance with the arts of peace compel us to class them among the most powerful nations of antiquity. It is the scattered fragments of this people's history which we are to garner, as best we may.

It is well known that in the time of Abraham there was in Asia a movement of the people pushing southward. It is not surprising that some of those wanderers, in pursuit of better pasturage for their flocks, should encamp along the eastern border of the Delta and look over with longing eyes on green fields along the banks of the river of Egypt. In a tomb of Beni Has-

san, built for Prince Knum Hotep, who lived under the XIIth dynasty, it is recorded that the immigration of Semitic tribes in his day was not unknown. A party of 37 immigrants from Absha, with their beasts of burden, babies and baggage, came begging permission to settle on the banks of the Nile. These may have been the forerunners of hordes that poured into Lower Egypt, awaiting the time when civil dissensions and the consequent weakness of the Egyptian government would enable them to seize crowns and sceptres, without the shedding of blood.

The Egyptian monuments call these foreigners: "*Mertiou*," meaning "to feed," or "feeders;" "*Sati*," meaning "Asiatic shepherds," and "*Aat-tu*," "a flail, scourge or pest." The Greeks called them Hyksos. What they called themselves we do not know, or how much Scythian element entered into their blood. The monuments they left in Egypt have recently become objects of great archæological interest.

In the Boulaq Museum is a bust, in grey granite, of an apparently kingly personage. It was found at Mit Fares, the ancient Crocodilopolis of the Fayoum. The features attract attention by their quiet dignity. The face, set in a frame, so to speak, of artificial hair, parted in the middle, is full and angular; the cheek bones are high, the eyes small and covered with thick eye-lashes, the nose flat, the mouth full of scorn, and the limbs plump and hard. The mutilated condition of the monument does not permit us to say *what* the hands once held, whether sceptre or rod, weapons or other implements.

Not less remarkable is another bust, which probably

came from Tanis, and is now in the Villa Ludovisi at Rome. It is executed in the same coarse style as the other, has the same prominent jaw bones, protruding lips, and curly beard, only the manner of wearing the hair is different. It falls over the shoulders in four thick locks, while on the back of the head is a tightly twisted pigtail of four thinner locks. This monument bears no name, and in the absence of the uræus, or asp, over the forehead, there is no proof that it was intended to perpetuate the memory of a king.

In the Museum of Boulaq is a colossal sphinx, in black syenite granite. It was found at Tanis with three other sphinxes of similar style and workmanship. "The expression," as Mariette said, "is full of majesty." A thick mane, like that of a lion, covers the head. This statue is doubtless the work of some skilled artist, and is the portrait of some kingly personage—some have thought that of Joseph, others that of Joseph's Pharaoh, made by order and direction of Joseph. This sphinx never received the customary cartouche of the king whose likeness it bears, but, by usurpation, three later sovereigns inscribed on it their titles: Apepi, the first king of the XVIth dynasty; Merenptah, son and successor of Ramses II. and Psousennes of the XXIst dynasty.

At Tanis have also been discovered the statues of two persons, standing on a common pedestal. They have the same general features which characterize the sphinx. It is generally supposed they were contemporaneous kings, perhaps father and son. Their hands seem to be occupied with an ingeniously arranged offering of aquatic birds, fishes and flowers. Nothing can be more

apparent than the total dissimilarity between all these statues, and those that are purely Egyptian ; especially is this true with respect to the treatment of the hair. This statue is also at Boulaq. Who were these foreign scions of royalty ? To what homogeneous or heterogeneous tribes did they belong ?

Following the thread of Egyptian history from the first dynasties down to the XIth, XIIth and XIIIth to the Antefs and Mentuhoteps, the Amen-emhats and Usertesesens, the Sebak-hoteps and Nefer-hoteps, the golden age of Theban power, art and civilization, suddenly there breaks upon us a dark age. Between the fourth king of the XIIIth dynasty and the last king of the XVIIth dynasty, there was a period of confusion. The cause was a foreign invasion. In the language of the politicians of California : " Hordes of Mongolian barbarians overran the sacred soil." Lepsius thought they came from Arabia, and were possibly the biblical Hittites. Julius Africanus, who edited and condensed the history of Manetho, said they came from Syria, and were allied to the Phœnicians. Mariette-Bey was certain that their last dynasty was of Hittite nationality. Chabas thought they were mixed, predatory, wandering tribes, with no affiliation at first, but growing into a compact nation after they settled in Egypt. De Rouge maintained that they were of Canaanite origin. Eisenlohr has discovered that mathematics and astronomy were studied at the court of their princes. Syncellus says that one of their kings, Nubti by name, first added to the year five intercalary days, making three hundred and sixty-five.

These Hyksos reigned in the Delta, with their capital

at Tanis, or Ha-uer, possibly also at Memphis, while the native princes of Thebes paid them tribute. At length a quarrel, which led to blows, broke out between Apepi and Sekennen Ra, who preserved the national traditions of the Thebaid; a quarrel partly about religion and partly about the water-courses. The war which followed is supposed to have been ended by Amosis or Ahmes, the first king of the XVIIIth dynasty, who defeated and expelled the Hyksos.

What became of this great body of foreign warriors, 240,000 strong, after their defeat, is still an open question. Mr. Sayce, on the authority of Num. xiii., 29, which says that the Hittites dwell in the mountains, believes "that Manetho had traditional authority for the statement that Jerusalem was built by the Hyksos after their expulsion from Egypt," and adds that "much is to be said, on the authority of Mariette and others, that the leaders of the Hyksos were Hittites." [*Acad.*, 23 Oct., 1886.]

From the nature of the case we must not expect a rigid mathematical *proof* that the Hyksos were identical with the biblical Hittites; yet a few considerations lead us to suspect that they may have belonged to kindred races.

1. The horse was known to the Egyptians only after the Hyksos invasion. The horse probably came from the Scythian heaths to Irania, thence to the Euphrates and the land of the Hittites.

2. In physiognomy there were so many points in common between Hyksos and Hittite that the presumption in favor of their close relationship is strong. Their high cheek bones, wide faces, flat noses, protruding lips

and retreating chins are an argument for racial kinship not easily refuted.

3. The vindictiveness with which the Pharaohs followed up the expulsion of the Hyksos for more than a century, with military expeditions to Kadesh, Hamath and Carchemish can be most naturally ascribed to revenge for injuries inflicted.

4. Those 240,000 Hyksos went somewhere, and wherever they went must have been a military power to be respected. There were not many distinct nations in Northern Syria, who could defy the power of Egypt on the one hand, and Assyria on the other.

5. Ever since the Hyksos invasion the Egyptian language has been mixed with Canaanitish words as never before. We know too little of the Hittite language, but almost the only proposition that is not questioned, is, that the ancestors of the men who made the tablets of Hamath and of Carchemish must sometime have been in Egypt.

6. Both Hyksos and Hittites worshipped the same God Set or Sutekh. He, and the Canaanite goddesses Baal Astarte and Anat Reshep, were first held in reverence on the Eastern Delta and then all over Egypt.

Max Müller has well said: "To know an ancient *people*, it is necessary to study their physical appearance, language and religion. A race may lose, to a certain extent its characteristic type, through difference of climate, of food, of habit, or through admixture of foreign blood. It may adopt a new foreign religion; it may forget its original language, but if we can find it preserving a type, a religion and a language which all belong to one original pure stock, we are then able to recognize

the relation of the stock to others of the same human family."

Accepting this dictum of Max Müller, we are authorized, for want of a better name, to call the Hyksos Hittites, yet remembering the Apostle's sage remark: "They are not all Israel that are of Israel," we cannot follow the history of these people across the ages without a break, or relate continuously the story of their political and social life. Our sources of information respecting them are four:

The *first* is the Bible. It speaks of *two* classes of Hittites: those of southern Palestine and those of the north, beyond the promised land. When Abraham led his Semitic tribe from Haran to Canaan, "the Hittites filled the land." (Gen. xxiii., 7) Of the few towns there built, a feeble branch of them occupied Hebron, near which was a cave that Abraham bought for a tomb. The lofty sentiment and polished courtesy under the cover of which they secured a large sum of "money current with the merchant," for a worthless cave in a worthless field, mark them as a mercantile community in a high state of civilization. Abraham and Sarah, Isaac and Jacob were all buried among the Hittites. Notwithstanding their consummate politeness, when Abraham needed help to fight Chedorlaomer, he went not to swarthy Hittites but to the white, blue-eyed Amorites.

In the book of Numbers (XIII. 22) it is said that "Hebron was built seven years before Zoan in Egypt." When we observe that the Hebrew word Hebron comes from Habar, "a companion," and that seven years after Hebron, a companion city *was* built in Egypt and called

by the same name, Ha-uer or Habār—from which comes the Greek Avaris, the presumption is strong that both cities were built by the same people, call them Hyksos or Hittites as we may.

The Hittites were said to be the sons of Heth. Heth from *halat*, in a causative sense (see Job. viii., 14) means “to terrify,” “to play the giant.” This corresponds with the *appearance* of the statues of men and sphinxes, found at Avaris, and we know with what consternation the spies whom Moses sent to the land of Canaan returned saying: “All the men we saw are men of great stature, . . . and *we* were in our sight as grasshoppers, and so we were in their sight.”

However much the sons of Heth appear to be dreaded, his daughters were not less so. Rebecca said to Isaac: “I am weary of my life, because of the daughters of Heth. If Jacob takes a wife, such as *these*, of the daughters of the land, what good shall my life do me?” Perhaps her reference was to Judith and Bāsh-emath, the Hittite wives of Esau, and, therefore, the traditional relationship between young wives and their mother-in-law may have been of Hittite origin. We are indeed told that Solomon loved Hittite women, (1 Kings xi., 1) but this is a doubtful compliment.

There seems to be a special bitterness in Ez. xvi., 3, where, in an eloquent invective, Jerusalem is taunted with having an Amorite father, and, what is the meanest thing that could be said of any one, a Hittite mother. Prof. Sayce suggests that a Jebusite was a cross between an Amorite and a Hittite, but the only thing certain about this passage is that the Hittites had exerted too strong an influence over Jerusalem, perhaps an

hereditary influence, affecting (1) complexion and features, (2) faith and religion.

Another biblical passage (2 Sam. xxiv., 6.) clearly refers to the great body of the Hittites who dwelt in the *North*. When Joab and his captains went out from the presence of David to number the people, they came to Gilead and to the land of Tahtim Hodshi. It is certain that this Tahtim Hodshi was to the extreme north of the kingdom of David. The exigencies of the account imply this; and if this be granted, the itinerary is perfectly intelligible, otherwise not. From the east of the Jordan, Joab went to Aroer of Gad, to Jazer, to this Tahtim Hodshi, thence to Dan, to the coasts of Tyre and Sidon and then to Beersheba. This Tahtim Hodshi has been a puzzle to translators and commentators. The latest "revisers" seem to know no more about it than their predecessors, and have simply given us the Hebrew words in English letters. That the text is corrupt is evident from the fact that Tahtim is an adjective in the masculine plural, and cannot qualify Hodshi, a noun in the singular feminine. Leaving out of the account the Hebrew vowels, there is only the difference of *one* letter, between Tahtim and Hahtim. "*Tau*" and "*he*" are often confounded in manuscripts, especially if one happens to be badly formed. Hahittim is the land of the Hittites. Cardinal Ximenes evidently supposes Hodshi to be a corruption for Kadesh, for he translates, (Complutensian Bible, tome II. f. xii.):

"They came to Gilead, and to the land of the Hittites of Kadesh." The identification of Hamath and Carchemish makes this translation perfectly reasonable.

Lagarde also in his edition of Lucian has adopted the above Greek translation.

For more detailed information of the Hittites of northern Syria, we must go, secondly, to the Egyptian monuments. They are there known as the Khita. It was under Thothmes III. of the XVIIIth dynasty that they are first mentioned as a distinct people of Asia. Fifteen expeditions this king made against the tribes of northern Syria. He met no resistance till he reached Kâdesh. After its fall he took Hamath, then Aleppo, Patina, Batua, and last of all, Carchemish. In the record of the fourteenth expedition he says: "And the tribute of the great country of Khita, in this year, was eight rings of silver, weighing 301 pounds, a great white precious stone, some chariots in birch wood," etc., etc.

We hear no more of the Khita till the accession of the XIXth dynasty. Ramses I carried war into Syria. Sapalel was king, the first Hittite monarch whose name has come down to us. He did not bow his neck to the Egyptian yoke.

Seti I. found *all Syria* in open revolt against Egypt. There were in alliance with the Khita, "the Lycians, Mysians, Dardanians, the Mesa of Ilion, and Pedássos." Seti's victory was dearly bought. The Khita, never knowing when they were conquered, always ready to renew a battle however discomfited, wore out the Egyptian's patience and he gladly made a treaty with Mourousa, the son of Sapalel. The booty carried home enabled Seti to produce some of his most costly works of art: the funerary temple of Abydos, "Seti's tomb" at Biban-el-Moluk, and the Hypostyle Hall.

When Ramses II. reorganized the army of Egypt, the

Khitan power was at its zenith. It was in the fifth year of Ramses and he was at Kadesh. The city was surrounded by water, and Ramses was drawn into an ambuscade; fought an army larger than his own, and came out of a two-days' battle with "honors doubtful." He was compelled to recognize the Hittites as foemen worthy of his steel. Motenor, their King, was a sly old soldier. He allowed Pharaoh to capture two advance guards, who said that their king had fled in fear to Aleppo; all the while his immense army was concealed behind the walls of Kadesh. Of a sudden he fell on the Egyptian centre and cut it in two. Eight times Ramses charged the enemy which surrounded him, broke through their ranks and rallied his own army. The fight was renewed, the next day, with more vehemence than before. It was a bloody day. Many a brave Hittite bit the dust.

At Ipsamboul is a picture of this Kadesh battle 77 ft. long by 25 ft. wide. It represents 1100 human figures, besides the animals. The tall slender Egyptians with horned and crested helmets, long swords, shields and spears are clearly distinguished from the thick-set Hittites armed with short swords, lances, bows and arrows—wearing the high cap and boots with upturned toes. One of their princes was drowned, and they are holding him up heels in the air to resuscitate him. After this battle, there was no great campaign, but incessant skirmishes and revolts. Peace was impossible until old Motenor was assassinated by his own soldiers. His son Khita-sar proposed to Ramses that an end be put to strife. Both belligerents were weary of the carnage; and after 15 years of warfare, the oldest treaty of peace now existing was drafted by the Hittites, and sent to Egypt, in Hittite

characters engraved on a silver tablet. Translated into Egyptian hieroglyphics, it may be now seen on the outer wall of the Karnak temple.

This treaty is a witness to the advanced state of Hittite civilization. It shows their familiarity with the art of writing, the extent and importance of their commerce, and the mixture of vigor and gentleness which characterized their laws. It is not occupied solely with questions of peace and war, but regulates diverse international arrangements, and sanctions the extradition of criminals, with the proviso that their punishment shall be mitigated in the country where their crime may have been committed.

This treaty between Ramses and Khita-sar was sacredly kept for a century. Ramses married Ra-ma-ur-neferu, the eldest daughter of his old foe, and Khita-sar accepted Pharaoh's invitation to visit his daughter in Egypt.

A tablet at Ipsamboul says: "The Egyptians are happy to have only one heart with the princes of Khita, a thing which has not happened before since the rule of the God Ra." Their old enemies became their favorites, and nothing was more fashionable in Egypt than imitation of Hittite customs, and larding the Egyptian language with Hittite words and idioms. After this the king of Egypt and the king of the Hittites are found fighting as allies against the Syrians. (2 Kings, vii, 6.)

The next we hear of the Khita from Egyptian sources was fifty years later. If our tentative chronology is correct, the Hebrews had spent their forty years in the desert and were driving the Hittites northward. There was a naval attack on Egypt, near Migdal, by people from

Asia, and in the list of princes subjugated by Ramses III. at Medinet Abou, it is said : "The unfortunate king of Khita was taken alive in battle." This is the last word the Egyptian monuments have to utter about "the Empire of the Khita."

This brings us to the *third* source of our information. A hundred and fifty years after Ramses III. the name *Khatti* appears in the cuneiform inscriptions. Kadesh has disappeared and Carchemish is the sentinel, guarding the road from Egypt to Asia. Its true site, on the right bank of the Euphrates, a short distance north of the river Sagur, was discovered in 1874 by Mr. Skene, British Consul at Aleppo, and the identification was verified by George Smith just before his death. The bronze gates of Balawat, covered with bas-reliefs, representing the campaigns of Shal-ma-nesar III. show that the ancient Carchemish was the same as the modern Djerablus. This identification is regarded as settling the question, "Where did the Hittites live?" for all the wars on Hittites, made by Syria on the one hand, and by Nineveh and Babylon on the other, had to begin with the capture of the Hittite Carchemish.

Tiglath Pileser I. perhaps contemporary with the Judges of Israel, says that the dominion of the Hittites extended from the Lebanon to the Euphrates, and even to the Black Sea. The Syrian tribes were subject to them. Pethor, the birth-place of Balaam, had fallen into their hands. Cappadocia was tributary to them. It was Tiglath Pileser I. who dealt them their first deadly blow, and during his reign their strength began to decline.

For 400 years a conflict was carried on with various fortunes between the Assyrians and the Khatti. Assur-

nazir-pal (883-858 B. C.) led his army to the Lebanon, and on an inscription found at the foot of a pyramid at Nimroud (Kalash), is a list of the booty he took from the Hittites: "Silver, gold, tin, copper, oxen, horses, and sheep." From Carchemish he carried home chariots and warlike implements.

Shalmanesar was a formidable enemy of the Hittites. In his tenth campaign, 842 B. C., he captured 87 cities belonging to Sangar. After Sangar, Pisiris was the Hittite king. Assyria was in trouble, and he thought it a favorable time to strike for independence. "He reckoned without his host." The annals of Tiglath Pileser II. are in fragments, but respecting one sentence there is no doubt: "Tribute from Pisiris, king of the city of Gargamis." Pisiris was still King when Sargon ascended the throne, in 722 B. C., and during the change of dynasties at Nineveh, again sought to throw off his yoke. He underestimated the spirit of the new king, who hastened to Carchemish, 717 B. C., plundered it, loaded Pisiris with chains and transported him and many of his subjects, beyond the Euphrates, and made Carchemish the seat of an Assyrian satrap. Isaiah hears the news, exults over the triumph of Sargon, calls him "the rod of the divine anger," and exclaims: "Is not Calno as Carchemish?"

Thanks to its advantageous position, Carchemish does not perish yet, but regains its ancient power. Incorporated with a great empire, it becomes the emporium of the commerce between Mesopotamia and the cities on the Mediterranean. Its *mina* was the standard weight throughout Asia, but Pisiris was the last of the sons of Khatti, whose name has come down to us.

Our fourth source of information is the monuments of the Hittites themselves. These are not so numerous or so imposing as are those of Egypt or of Assyria ; yet our surprise that there are so many will be pardoned when we think how the destroying Scythians swept over the land ; how the Seleucidæ, with their mania for building and rebuilding occupied the territory ; how the Romans followed the Greeks, each pulling down to build up ; how the Mohammedans drove out the Byzantines ; how the barbarous hordes of Crusaders captured and sacked most of the towns on the plains adjacent to the Orontes, how for centuries the Turk—the very evil genius of destruction as he is, has been fulfilling his destiny by turning its splendid temples into heaps of ruins. The spoiler has been in the land 2500 years, yet, on the other hand, it is only within the last ten or fifteen years that the monuments discovered are so numerous, and the similarity observed in them so surprising, that they are now the chief objects of interest to archæologists throughout the world.

The monuments we are to visit are on both sides of the Taurus. They are at Hamath, at Aleppo, at Djerablus, at Sindjirli and Marash in the East, at Karabel, at Ghiaur-Kalesi, at Eflatûn-bounar, at Ivreez, at Boghaz-Keui and at Eyuk in the north and west.

Nobody ever knew exactly where to fix the eastern boundary of Asia Minor. Between that indefinable country which belonged to the Greeks, on the one hand, and the land of the Assyrians on the other, are fertile table lands, watered by numerous streams, extending, at least, over five degrees of longitude and seven degrees of latitude, an area equal to twice that of all New

England and New York. The student of ancient history has not been accustomed to take this vast territory and its inhabitants into account. He learned the stereotyped facts about Egypt, Mesopotamia, Greece and Rome, and was happy that he knew all that antiquity had to teach. Perhaps it is an unwelcome intrusion to disturb this complacency and repose, and that, too, for the sake of a horde of barbarians, who have no place in classic story.

At Karabel, on the road from Smyrna to Sardis, we find engraved on a rock the picture of a warrior, above natural size. In the time of Herodotus it was supposed to bear the marks of Egyptian and Assyrian influence. It must have been regarded by Herodotus as an ancient monument, for his information respecting it was imperfect and the historical occurrences he relates in connection with it are palpably false. We shall see in Cappadocia, in Lycaonia and in Syria the same movement, the same position of the arms, the same conical hat, the same sword, indicated in the same way, the same short tunic, and the same shoes with up-turned toes.

Not far distant is the statue of Cy-be-le, sometimes called "The Niobe," regarded by some as the oldest piece of sculpture in the world. It is a colossal, roughly hewn figure of a veiled woman, carved in the face of a limestone crag. Its antiquity was unknown in the time of Homer. [*Iliad* xxiv., line 605.] According to Pope, Homer says :

"There, high on Sipylus's shaggy brow
She stands ! her own sad monument of woe ;
The rock forever lasts, the tears forever flow."

This can hardly be a Hittite monument, yet the inscription on it now seems to be Hittite !

Boghaz-keui and Eyuk are two hamlets in the mountainous districts of Cappadocia. Boghaz-keui is in a valley extending from east to west, watered by two streams running in the same direction. Here are ruins of high antiquity; here craggy mountains overlooking the plain, showing the remains of elaborate fortifications; here immense blocks of stone, artistically matched; here graven images, painted pottery, cisterns, stairways and passages, cut in the solid rock; here a raised seat, or throne, ornamented on either side with the bust of a lion. His head and face are in full boss, his body in high relief.

Two miles from Boghaz-keui is an enclosure called Ya-sili-kaia, formed by nature, enlarged and beautified by the hand of man. On the inner surface of its walls are sixty-seven figures of life size and larger, cut in a calcareous crystalline rock of extreme hardness.

On the left the first group consists of thirteen persons, all in the same posture and costume. Each wears a conical headdress, a light tunic, and the boot with toes turned up. The two leaders carry a bow.

The second tablet represents a procession of armed men, bearing emblems or presents. They are bearded and wear the Assyrian helmet, slightly turned up in front. Their costume is a loose robe, striped diagonally and fastened by a girdle.

Another tablet continues the subject, whatever that may be. Eight of the nine persons bear weapons or emblems. One carries a club, another a scythe or reaping-hook; three carry sabres, with crooked blades, and several have the *crux ansata* or round-handled cross.

The two middle figures are an enigma. Two colossal persons stand on a socle, with a sort of barque over their heads.

The last tablet on the left represents persons of a superior rank. The leader wears a long beard and a conical helmet. A woman follows him with what look like enormous rings. Behind the next two persons is an old man with wings. The last figure is overshadowed by the winged globe.

What do these strange objects mean? Is this a procession led by the monarch? Are the people preparing for a festival? or is this the record of some great celebration?

On the right side of this enclosure are two tablets. The first represents ten women, wearing the cylindrical tiara, robes with long sleeves, and bound around the waist by a girdle. The fulness of the drapery is seen in its ample folds. This procession is led by three women in the same costume. On the left we saw a group of thirteen men; now here is that same fatal number of women!

The central scene was the chief object of interest. It is so still. It is the meeting of the two processions. A man of gigantic size, with long beard, conical helmet and short robe is exchanging presents with a woman as gigantic as he. Both bear the *crux ansata* in the middle of a lotus. The man carries a club. A Scythian battle-axe is fitted into his girdle, and, of course, his boot toes turn up.

Though in his costume no attributes of royalty are apparent, his elevated rank cannot be doubted. He is borne on the shoulders of two men in trailing robes.

Behind him are two men, one unarmed, the other with a club, both walking on the mountains.

The queen, or goddess, holds in her right hand a sceptre and stands on a lion, which walks firmly down from the summit of a mountain. Her flowing hair is confined by a girdle. Behind her head is an undefinable figure, the upper part of which resembles the object she holds in her *left* hand. Each of the two principal figures is accompanied by the male unicorn, doubtless the emblem of some religious idea.

In recesses and corridors of the rock, among other figures, is a beardless person, with a conical headdress, the crosier reversed, the semi-lunar hilt of the sword just visible, and, of course, the turned-up boot toe. The left arm of this graceful figure is thrown affectionately around the neck of a smaller figure. Above the right hand is a symbol of something, and behind the head a shrine, overshadowed by a winged star, and supported by two Ionic columns.

What do these pictures and what do these processions mean? A mythological rather than a historical atmosphere seems to pervade it. Was this inclosure the principal sanctuary of the tribe? Was it the abode of the oracle? In this immediate vicinity the Greeks placed the home of the Amazons. Did the Greeks regard the Amazons as myths, or as historical persons? It *may be* these processions relate to the worship of Anāitis, who is fabled to have come, on the back of a lion, from the East, perhaps Media, and that the Capadocians met her with gifts and welcomed her with pomp and ceremony.

In Asia Minor, before the language and worship of

the Greeks were introduced, kings and gods were pictured standing on the backs of lions or other animals.

The wretched little hamlet of Eyuk (the word means hill) lies 18 miles north of Boghaz-keui. The entrance to the ancient ruins is flanked by two huge blocks, on each of which is cut a so-called Sphinx. The heads and necks are in full round relief, the body in demi-relief, and the legs only roughly formed. Each head seems to be that of a woman. A cloth covers the hair, and hangs down on either side like the mask of Hathor.

Turning from this main entrance to a smaller one on the right, we find on a corner-stone two figures, whose long robes, round caps and crosier indicate the priestly office. The foremost one seems to stand in adoration before an altar. The second one is an attendant, for priests never go in groups or in pairs.

On an adjacent stone is a female form in a long robe sitting on a low wooden chair. Her hair hangs down her neck, and a small pig-tail extends from her crown to the seat of her chair. She wears a necklace, and her arms are enclosed in tight sleeves. Her right hand holds to her mouth a shell or cup, suggesting a libation. Her left hand holds a lotus. Her feet rest on a stool and the toes of her shoes turn up in a complete circle.

Possibly this is a divinity in whose honor the ceremonies recorded here were celebrated, for towards this being all adjacent figures turn their faces. We have here a procession which reminds us of that at Boghaz-keui. The figures are badly defaced, but enough remains to show that the clans or tribes who once lived here were neither Egyptian, Assyrian nor Greek.

Of the many figures on these loose rocks, one de-

mands special attention. It is an eagle with two heads, and a rabbit in each one of his talons. Above it, nothing now remains except a foot, and the bottom of a trailing robe. We saw a similar figure at Boghaz-keui. This emblem did not disappear with the final conquest and annihilation of its inventors ; for Arab tradition describes a mythological eagle called the "Hanca," and on coins of the Turcoman princes, as early as the 13th century, A.D. we find this same emblem. Moreover, in the 14th century, this doubleheaded eagle was on the standard of the western emperors, and later still was adopted as the ensign of Austria and of Russia. Thus comes down to our time from an Asiatic culture of the highest antiquity a symbol, whose original meaning we may not divine, but which, by a strange turn of fortune, confronts the Turks at Belgrade and Lepanto, though it was this very eagle which triumphantly led their predecessors to the banks of the Euphrates, and, perhaps, to the Bosphorus. The Greeks called this region *Pteria* from *pterón* "winged." Was this name given with reference to the spread wings on the standards of the people ?

Before leaving *Pteria*, notice that *some* of the salient features of these relics are found elsewhere. The helmets and doubleheaded axes were common from Chaldea to Persepolis ; the winged globe, Ionian columns, *crux ansata* and sphinxes are Egyptian. Yet it may not be necessary either to affirm or to deny that these imitations prove intercourse between the clans dwelling in *Pteria*, and the nations in the valleys of the Nile and the Euphrates.

Three hours ride from Eyuk brings us to the village

of Aladjâ. It occupies the centre of a plain watered by an affluent of the Iris. It is a two hours climb from here to a grassy mound called Sherdek-kai-asi, on the summit of which is a remarkable tomb cut in the solid rock.

Facing the east is a portico formed of three thick short columns, which, except for the bases, would be Doric. On each side is a funerary chamber. The window, its frame-work and pediment, and the general appearance, lead us to believe that this monument belongs to the very earliest period of Greek art.

Turning now our course south-easterly, down the valley of the Sangerios, 112 miles from Boghaz-keui, we come upon the fragments of a strong little fort—now called Ghiaur Kalesi—"the fort of the infidels." In the limestone rocks are two colossal figures, in relief, facing the west. They wear long beards, short doublets, girdles, shoes with upturned toes, and pointed hats. In attitude, movement and costume they have the same characteristics as other Hittite figures.

From here it is an eight hours ride to the fountain called Eflatoûn-bounar, "the fountain of Plato." Why thus called is not known. Here is a façade of fourteen stones of reddish brown trachyte. Here is a lion in high relief, in company with other animals, suggesting a frieze, like that at the Parthenon. A pair of outstretched wings hovers over other figures, human beings, standing and holding their arms aloft. One, on the left of the centre, wears the high pointed hat. These figures may be demons, whose gestures were designed to frighten away the profane; or this structure may have been a *temple* to the God of the fountain whose gushing

waters fertilize the plain ; or it may have been a dam. The work shows originality, but the want of artistic skill. This monument was visited in 1884 by the Wolfe Expedition.

Still further south, at the foot of a mountain belonging to the Cilician Taurus is the village of Ivreez. Abundant streams rush down in torrents from adjacent wooded heights, and the region is rich in gardens and orchards. The monument we have come to study consists of two colossal figures. The subject is evidently homage paid to a God by priest or king. The God is the author of fecundity, the local God of corn and wine. In his left hand is a sheaf of wheat and bearded corn. He is clad in the simple garb of a peasant, with the conical tiara and horns, the emblem of force. The artist has succeeded in giving him a cheerful expression.

The priest or king must, of course, be smaller than the deity he worships, but he atones for this misfortune by the greater richness of his costume. Besides the Jewish *features*, this monument differs from all others on Hittite ground. Yet the inscriptions are Hittite. The work may not be so old as those we have seen, but this may prove that the same system of writing was used through a long period, and perhaps for different idioms and languages.

Thus far we have studied the Hittite monuments in Cappadocia and Phrygia, a part of the ancient Anatolia, a district which we *call* Hittite, only because of the Hittite characteristics of its numerous monuments. To find monuments which we know are Hittite, because in the country where the Egyptian and Assyrian armies

made war on Hittites, we must turn our footsteps eastward. We shall cross the Taurus range, passing through the "gates of Cilicia," famous for having been revealed to the younger Cyrus by the wife of a native prince, whom he had seduced. Coming into the beautiful Plain of Adana, we are tempted to tarry at Tarsus, the home of Paul's boyhood, but the Hittite seal found there is in the British museum; the white marble sarcophagus containing the bones of its Tarsus owner is in the New York Metropolitan Museum of Art; and the Hittite ruins in the neighboring Dell-nü-tück, though extensive, furnish no new data. We pass out through the southwestern iron gateway of Tarsus; wend our way through Adana and Messis, the ancient Mopsuestia, named for Mopsus, one of the Argonauts, and celebrated as the See where Theodore taught the heresy, that Christ came to deliver man from an imperfect not a ruined, nature, and that eternal punishment is therefore impossible. Ascending the valley of the Pyramus to Ghiaur Dagh we come to Sindjirli, where an American traveller was the first to report the existence of several slabs which once decorated a Hittite palace. These blocks helped to form two sides of a room. Three slabs were on the left, four on the right. The pictures represent the Hittites as short and stout, with prominent noses and retreating chins. The second figure from the left is bare-headed, carries a bow in the usual Hittite fashion, and has boots with toes that turn up. The third figure wears sandals, a close fitting cap, a long robe, with short sleeves, fringed at the bottom and fastened with girdles. Another slab was probably placed at the gateway as a warning to tramps. The figure on it looks wicked enough to be the Hittite

devil. These rude sculptures represent the North Syrian school of art, at an early period, and are therefore of great archaeological interest.

Fifteen miles north is the ancient Germanica, the modern Marash. Among the many Hittite monuments found here, deservedly famous, are two lions. The one inscribed is at Constantinople, the other uninscribed still stands on the wall of the fortress. These lions are in the same style as those we saw at Eyuk. As we descend the plain a hundred miles long from Marash to Antioch, we shall be struck with the ample evidence that the civilization which had force enough to push through the gorges and defiles of the Amanus and the Taurus, was not idle in its home between the Orontes and the Euphrates. Artificial mounds, the sites of old forts, of large cities and of small ones, are so near together, and so *arranged*, that no one mound is out of sight of another. It was always possible to keep up a chain of communication from Aleppo to the Euphrates, and from the Euphrates across the plain of Adana. In case of an invasion the advance of an enemy could be telegraphed by beacon fires for hundreds of miles.

In 1872 Mr. Drake published in his "Unexplored Syria," the fac-simile of an inscription found at Aleppo. The following year Mons. Clermont-Ganneau published another copy. These copies did not agree. While scholars were preparing to take a cast of the stone the natives destroyed it. The revision made furnishes still another witness to the similar characteristics of Hittite writing. The stone had been much worn by natives who had rubbed their eyes against it with the hope of curing their ophthalmia.

We approach Djerablus, or Jerabis, the ancient Carchemish, where were the best known specimens of Hittite writing. A lion found here with two divinities standing on his back, shows identically the same treatment of hair as that of the Hyksos Sphinxes. Other sculptures at Carchemish, of great size, giving new views of Asiatic art, are now lying in the trenches. We have no casts of them, no photographs, but they are said to show Egyptian and Assyrian influence as well as native inventive power. About fifteen basaltic slabs, besides numerous fragments, all of acknowledged origin, have been carried from here to the British Museum. The inscriptions are in raised letters, arranged in horizontal rows, separated by raised lines, about four inches apart. The longest inscription is found on the curved surface of a stone. It was first noticed and copied by the lamented George Smith. Many of its characters are quaint and unlike those found elsewhere. On the flat side of this stone is the broken image of a priest or king. His long striped robe was doubtless admired when new, and the bands across the breast with roselike figures, must have created a sensation.

Four stones found at Hamath, now removed to Constantinople, disclose the same characteristic hieroglyphics. Their removal from Hamath was accomplished with difficulty, because some of them were built into walls, and because the natives believe that one at least possesses magic healing power. The catholic spirit of the Moslems is seen in their admission that, for a small fee, their healing stone would be as efficacious to a heretic, calling on St. George, or on the Holy Virgin, as to the faithful follower of the Meccan prophet.

Only within the last twelve or fifteen years have men begun to ask what these strange characters mean. In 1872 Hyde Clarke first suggested that they were alphabetic rather than syllabic, and guessed they might be analogous to the Himyaritic, but of greater antiquity.

The same year Dunbar Heath was certain he had discovered in them strong Egyptian analogies, and had even found the names of Amenophis I. and of Thothmes III. Eight years afterwards he abandoned his Egyptian theory and was equally certain that the dialect was fair Chaldean.

What Prof. A. H. Sayce calls the "Boss of Tarkondemos," is a silver cup of the size and shape of half a small orange. It represents a warrior in form and costume, arm and leg, sword and hilt, for all the world like the figures we have seen at Karabel, Boghaz Keui, Eyuk, and Ghiaur-Kalesi. A row of cuneiform characters is in the disk and clearly enough Hittite letters in the field. Mr. Sayce believed that he had found a bilingual monument—a genuine Hittite Rosetta stone. The cuneiform legend was easily read :

"Tarrik-timme, King of the Country of Erme."

In the Hittite characters he reads the same legend. With this key thus obtained he attacks other Hittite texts, and publishes a list of thirty-one characters with the supposed meaning of each. He thinks he recognizes the Mongolian type, the agglutinative character of the Hittite language, compares the Hittite with the recently discovered Vannic characters, and claims the honor of the discovery that in the Cypriote emblems we have the hieratic forms of the Hittite emblems. In the *Academy*

of the 19th of January, 1889, Mr. Sayce suggests that the language of a greater part of the Tel-el-Armana tablets belongs to some Hittite dialect.

The Rev. Charles J. Ball seems to waver between the theory of Semitic and of Aryan, or rather of Scythico-Iranian analogies. His patient, careful study has, indeed, given us no new translations, except those of a few proper names, but he confirms the suggestion previously made, that the inscriptions are to be read like Egyptian towards the faces of the living beings; that the characters are partly ideographic, partly phonetic and often redundant. He recognizes the indebtedness of scholars to Dr. Wm. Hayes Ward for the suggestion that the lines are to be read in the *boustrophedon* method, as the ox ploughs.

Capt C. R. Conder has written voluminously on this whole subject, has suggested numerous theories, but aside from the interest he may have inspired in the study of the Hittite monuments, it is difficult to say what he has accomplished. Fanciful analogies with Basque, Magyar, Finnic, and Ugrio-Iranian dialects do not solve the mystery of the Hittite inscriptions.

Prof. John Campbell, of Montreal, endeavors to establish the existence of a family of languages which he calls Khetan. This includes the Basque, Caucasian, many Siberian dialects, and the Japanese, Dakotan, Iroquois, Choctaw-Maskoka and Aztec tongues. He then finds the literary remains of this great Khetan family not only in Asia Minor and Etruria, but in Northern India, in Siberia, in Japan, in Mexico and elsewhere. There is not only a unity, he says, in these Khetan languages, but a unity also in their graphic systems. Dis-

tance in space and time separating Hittite and Aztec hieroglyphic systems is nothing. They are one for all that. The Corean alphabet and the Cypriote syllabary both unlock the mystery and prove the unity of Hittite and Aztec hieroglyphics. It is hoped that his book, soon to appear, giving to the world a translation of all the principal Hittite texts, will make everything plain.

Among others who have earned the grateful acknowledgement of scholars are Prof. Ramsay of Aberdeen, Prof. Golenischeff of St. Petersburg, Mr. Thomas Tyler, and Mr. Theodore G. Pinches of London, and last, though not least, Prof. Francis Brown, D.D., of Union Theological Seminary, New York. His article in the *Presbyterian Review*, for 1886, is a masterly production.

Respecting the religion of the Hittites the Bible is silent. We receive our first clue to some of its features from the treaty between Ramses II. and the Khitan King, Khita-sar. The treaty says that Ra is the chief god of the Egyptians, Sutex ($x=ch$) the chief god of the Khita. Ten Hittite cities are named in the treaty, of each one of which it is said: "Sutex is its god." In harmony with this the Hyksos monuments of Avaris inform us that Set or Sutex was the god of the Shepherd Kings long before their migration to Egypt. The first king of the XVth dynasty bore the name Set-Pehati, *i. e.* "Set the Powerful," sometimes Nubti, *i. e.* "Set the Golden," or "the Resplendent"; whichever of these two ways his name was spelled, the determinative following it was always the well-known image of Set—a jackass with his tail erect.

He was *not* originally the emblem of evil, but was a

sun-god, *i. e.* one form of the great life-giving power in nature ; Osiris was his brother, Nephthys, the sister of Isis, was his wife. The Tablet of San-Tanis, engraved in the time of Ramses II., calls Set "the son of Nut, the mighty god in the bark of millions," the very title by which Ra himself was called. He was also represented as sitting or standing on the highest point of the bark of Ra, and was called "the Lord of Life." All this does not imply that Set was the only Hyksos or Hittite god, for their monuments also speak with reverence of Ra and of Horus, but Set was certainly *one* of their gods from the earliest time. That he was their chief god appears from the Papyrus Sallier I., which says that "Apepi (now supposed to be the Pharaoh who elevated Joseph to office) chose Set for his god and built to his honor, at Ha-uer, a costly and an enduring temple." This may mean that Apepi made the fact conspicuous that Set was his *god*. Perhaps he was the first to identify the Hyksos Set with the Egyptian Set.

Set seems to have been only another name for the Egyptian Bār or Bāru, the Canaanite Baal, the proprietor and lord of all things, the emblem of productive power. Therefore, in the poem of Pentaur, when Ramses II. is represented as slaying the Hittites right and left, they cry out : "It is no *human* being that is in him : It is Sutech, the mighty Sutech, the son of Nūt. Bār is in his limbs."

It was only after the expulsion of the Hyksos that the Egyptians associated Set with their enemies, and began to regard him as the personification of evil, the emblem of darkness and night. Then an infuriated

persecution burst forth against him, and his image was mutilated on all the monuments. Then he became a wicked demon, and in the Book of the Dead is represented as a flame, the tormentor of souls.

Thus the Hittites, like the other nations of their time, stood in fear of that occult power whose heat they felt in the sun, and whose angry voice they heard in the thunder, but who was to them a mystery. This sensual religion had little or no influence over the moral life. In *all* the ancient religions the 125th chapter of the Book of the Dead stands alone in giving emphasis to private virtues. Yet even *this* chapter is full enough of demonology and magic formulas.

Doubtless the debate will continue to be waged around the question: Whether the monuments of Lydia, of Phrygia, of Cappadocia and of Northern Syria, especially the hieroglyphic inscriptions, are all to be regarded as Hittite? They are so regarded:

1. Because of their undoubted likeness in many characteristic features.

2. Because, it is said, no other people has shown the power or the culture needful for the construction of such monuments.

3. Because, even if the monuments of Northern and Western Asia Minor were not the work of permanent residents, but of successful invaders (though this is not supposable of Boghaz-keui or of Eyuk), yet the Hittite army was the only one of which we have any knowledge strong enough to make that invasion.

4. Because the Egyptian inscriptions of the XIXth dynasty show that there was a close connection between the Khita and the tribes of Western Asia Minor. The

Khita were aided against Ramses II. by the Dardani-ans, Mysians and Lycians.

It is objected that the Bible, the Egyptian and the cuneiform texts all agree that the Hittites dwelt between the Euphrates and the Orontes, that Carchemish was the home of their king; that no monuments speak of Hittites elsewhere, neither does Herodotus nor any other ancient writer.

To this it is replied that Homer, (*Od. xi.*, 521) refers to the Kēteioi, as well known warriors, the slaughter of whose chief was the crowning glory of Achilles; that in *Josh. i.*, 4, it is said that the land of the Hittites extended from the Euphrates to the Great Sea, that mention is made of the kings of the Hittites and of "all the kings of the Hittites," as though there were known to be several contemporaneous Hittite monarchs. We know moreover that the Khita on the Orontes led in their train tribes more or less closely related, whether independent or confederate, whether dwelling in Northern Syria, in Cappadocia or in Phrygia we may not be able to say. Mr. Wright entitles his book: "The Empire of the Hittites." Such an Empire as that of China or of Russia, certainly the Hittites had not.

To the further objection that the tendency in the north was towards architecture, in Syria towards plastic art, and that the Cappadocians were more skilful than their supposed masters of North Syria, we have only to remind ourselves that climate and scenery have an influence on art which we cannot explain. The Greek artists were superior both to their teachers and to their pupils.

Possibly Hittite may not be the most scientific word

to express the parentage of these newly found monuments, possibly Anatolian, or Lydo-Phrygian may be better, but that there are points of resemblance between the sculptures, reliefs and written characters of ancient Anatolia and of Syria beyond what can possibly be regarded as the effect of accident or of borrowing, an agreement much closer than with either Assyrian or Egyptian, is unquestioned. That a system of writing by pictures should be invented three times, within narrow limits, that is, in Egypt, in Babylon and in Asia Minor, is no more incredible than that it be invented twice. From Karabel to Eyuk and from Eyuk to Hamath, the language seems to be essentially one. The material of which the words are formed is one. Nothing but community of linguistic tradition can explain such a phenomenon.

At that remote period during the XVth and XVIth centuries before our era—when the dawn of history was just beginning to glimmer, to what other nation can we point comparable to the masters of Hamath and of Carchemish? What other people was compact and strongly enough established, to hold in check the best efforts of Egyptian valor, prestige and discipline? Those who could form a union strong enough to hold at bay the everywhere victorious Thebans, ought to have had those mental resources which the creation of a written language supposes. Who is it that has no interest in the art, the skill, the character of that energetic, valiant people, just merging into the light of history? Who has no inquiries to make respecting the books they wrote, the records they kept, the songs they sung, the hopes they cherished?

On this whole subject the one thing we want is more light. It is hardly fair to say that we have nothing to offer but conjecture. The monuments we have are facts. Their remarkable similarity is a significant fact. Why disparage conjecture? How was the Rosetta stone deciphered but by trying conjecture after conjecture? How was any puzzle ever solved but by a lucky conjecture? Hundreds of monuments, bearing the same characteristic features which we have seen exemplified are sleeping beneath the soil of Northern Syria and of Asia Minor, waiting for the touch of a spade and for the genius of a Champollion. Science waits, art and literature wait for some "Wolfe expedition" to be sent to Eyuk, for instance, with orders not to return, until its hidden treasures shall see the day; and through more extensive comparisons and collections conjecture and theory be converted into positive proof. To American enterprise, generosity and scholarship may the honor be given of Hittite discoveries, certain and sure to be made!

THE PORTUGUESE IN THE TRACK OF COLUMBUS.

BY

DR. P. J. J. VALENTINI.

VI.

NAMES OF PARTICULAR INTEREST.

Because they are expressed in clear and distinct letters the reading of the twenty-two names hitherto discussed presented no difficulties. Much the greater portion of them was susceptible of interpretation and found to be derived from impressions and incidents which the navigators received and noted down.

Among these twenty-two names, however, there are some which are worthy of still closer discussion, because it seems probable that they may be brought into a most effective relation to the substance of the expedition itself, and may, therefore, contribute to the solution of our problem. We mean the two proper names of *Martinho* and *Don Diego*.

With regard to the name *Martinho* attention must be called to the fact that it was not meant for the saint in the calendar, and that, consequently, it was not intended to note the day of discovery. We have not to deal with a San Martinho, but evidently with a Don Martinho, with the proper name, therefore, of a person well known to the mariners, a man whose memory they wished to preserve, and to whom, for reasons

of their own, they particularly desired to do honor at this time.

If we look to Portugal and to a man then living who bore this name and deserved such a commemorative distinction, it is but natural that we should be reminded of *Don Martin de Noronha*, the cavalier of honor so often mentioned by Columbus. It was Martin de Noronha who, by the order of King Joam, came to Lisbon to tender the royal invitation to Columbus; it was he who presented him at court in Val de Paraíso; he it was who in all Columbus's movements remained by his side as an obliging and watchful companion. These facts alone would suffice to prove that Don Martinho was a person of the highest distinction; and when we come to examine the Portuguese records, we find that his ancestors had for generation after generation been invested with the highest dignities of the kingdom, and that these were still held by members of his family in the time of Columbus. The Noronhas were blood relations of King Joam. Their ancestor, Don Alfonso, a Conde de Gijon y Noronha and son of King Henrique II of Castile, had been married in 1378 to Isabel, the daughter of King Fernando de Portugal. What particular rank Don Martin occupied at the king's court the Book of the *Grandeas** does not tell. It states only that Don Martin became the founder of a new line of his illustrious family, that of Angeja, which is still flourishing to-day.

In like manner it will be easy to bring the other proper name, that of *Don Diego*, into connection with

* See Gaetano de Souza, *Memorias hist. e genealog. : Dos Grandes de Portugal*, Lisboa, 1755, page 83. Genealogical hist. of the Noronhas.

that person in whose palace Columbus after his first audience was invited to pass the night, *Don Diego de Almeida*, the rich prior of Crato of the Order of St. John, the chief master of the royal hounds and castellan of Torres Novas.* The people knew him as a kindly gentleman and the king's intimate friend. The glory of his family dated from the day on which his ancestor, Payo Gutierrez, in the reign of King Sancho I. had taken from the Moors the stronghold of Almeida. Don Diego was also the brother of Don Fernando, the admiral, who at the time of Columbus's return from the West was waiting in Madeira with a fleet for orders to start on an expedition. Finally, that both Don Martinho and Don Diego must have stood in high estimation with the king is clearly shown by the circumstance that we find their names among those of the four witnesses who signed King Joam's testament.† When, therefore, an opportunity presented itself for erecting a flattering memorial on this far-off western coast to persons of distinction connected in a certain way with its discovery, the names of these two grandees must have suggested themselves before any others.

In connection with these two names another strange circumstance is worthy of mention. We find the names of the two courtiers wanting on the three maps of later date than that of Cantino. Neither Ruysch nor the Ptolemy of 1513 gives the names of Don Martinho and Don Diego, while Schoener has that of Don Diego but omits Martinho. We know that King René of Lor-

* The same, page 266, that of the Almeidas.

† *Provas d. l. Hist. gen. da Casa Real Portuguesa*, by the same, Lisboa, 1742, Tom. II, pag. 175.

raïne, who liberally contributed the great expenses for the editions of Ptolemy of 1508 and 1513, had received copies of a Portuguese marine chart through the agency of Amerigo Vespucci. Is it not possible that this busybody of a geographer, who stood under great obligations to the crown of Portugal, took care to suppress these two names? May they not even have been erased from the original map which is said to have decorated King Emanuel's study? It is not difficult to understand that it might have been wished to destroy everything connected with that ugly affair of 1493, and that the two grandees might have thought it unbecoming to have their names paraded on the chart. It is unnecessary, perhaps, to dwell upon these natural suspicions, when we take into account the errors traceable to copyists, with their disposition to spare themselves labor and time, even at the expense of correctness.

Besides these two Portuguese proper names two others inscribed on this tract of coast, *Coruejo* and *Canfuze*, attract our attention. As already said they defy translation. The spelling of them differs on the three later charts, and this suggests that the copyists must have found great difficulty in interpreting the reading of the original charts. The names are conspicuous also for their lack of qualifying words such as *rio*, *golfo*, *cabo* or *punta*. On all these grounds taken together, as already observed, it seemed best to look upon them as words or names expressed in the Portuguese language, but picked up from the mouth of the indigenous people of this coast.

As to the word *coruejo* or *cornejo* let us say at once that we do not see in it the word *Conil* proposed in-

geniously enough by two eminent geographers.* It will be learned from the quotation below, that both these writers concur in the opinion, well grounded and clearly set forth, that the representation of this coast, as given by Ruysch and his followers, is nothing else than the continuation of the coast of Darien and Honduras, and that it presents, therefore, in a manner the outline of the peninsula of Yucatan; an opinion, which with us has ripened into a firm conviction. Humboldt and D'Avezac had not, as we at this day have, the good fortune to be able to consult the original copy of the three often named editors. They followed Schoener's (1520) suggestive spelling of *coniello* and on the ground that all subsequent maps, up to this day, show at the corresponding place the name of *Conil*, they quite naturally inclined to merge the one name in the other. Although the detection of a name, apparently of native origin, would eminently suit the purposes we have in view, there are strong

* A. v. Humboldt, *Examen crit. d. l. géogr. d. Nouv. Continent*, Paris, 1837, Tom. II, page 6, and the same, *Relation historique*, Tom. II. p. 706.—Mr. d'Avezac, *Les Voyages d'Amérique Vespucée*, in *Bull. d. l. Soc. d. Géographie*, Paris 1858, Tome 16, page 182: "Peut-être même encore le mot de *Coniello* est-il une altération sous laquelle se laisserait deviner le nom actuel de *Conil*, entre le Cap Catoche et le rio de Lagartos." On the same page: "mais où nous ne saurions voir, avec A. v. Humboldt, que la presqu'île de Yucatan."—Schoener's globe, 1520, was the last that gave the coast west of Cuba the long-stretched form as represented in the Portuguese chart. Later on, (after 1520), all the charts begin to show the body of Yucatan in its genuine peninsular shape, and to put the names of *Conil*, *rio de lagartos*, *punta delgada*, *Campeche* and *cabo del incontro (pelea)* in the places and in the succession in which we read them on the Portuguese chart. This fact alone, even if other evidence were wanting, would suffice to prove that the later Spanish navigators were guided by good copies of the Portuguese Marine map, showing on its face the triangular form of the peninsula. As to *Conil*, we entertain grave doubts of its being a native name. No place or village of this name is found nor does any tradition point to its existence on the soil of Yucatan. We rather think the name was given by the Portuguese mariners to this spot on account of some peculiar feature resembling port Conil on the other side of the ocean.

reasons to keep us back from falling into line with the two savants. We argue that if the first explorers had met at this place with a settlement called *Conil*, they would have put it on paper in this form, whereas each of the four readings gives it an additional ending of respectively: *ejo* (*eyo*) *eo*, *tiello* and *iello*. If any emendation of the word *cornejo* is to be risked, these syllables must be taken into account. If we suppose that the little dot or tail beneath the *z* has been omitted [*r g*] so as to change *r* into its graphic cognate *x*, the word as first written must have been *Coxmejo*, and this we take to be a form of *Cozumello*, which is the name of the large island of *Cozumel* not far east of *Conil* of to-day. Its spelling on non-Spanish maps in the 16th century was *Cotzamello*, *Cotzamillo*. The word is probably derived from *cotz*- fowl, *a*-water, and *molay*-reunion, assemblage; hence "gathering of water fowls."* It is well known that this island formed the portal of the discovery and conquest of Yucatan as of Mexico. The Spanish captains Hernandez de Cordova, Grijalva, Cortes and Montejo, all of them made their landing there before setting their foot on the continent. Its pyramid with the white temple upon it was seen "glistening like a silver pharos far out to sea," and could not possibly have escaped the prying eyes of the captain of King Joam's fleet. The inscription on our map is placed behind cape *do fim de Abrill*. Not so the Ptolemy

* ('Waterfowls.') Whenever we have an opportunity to remind the student of J. Lloyd Stephens, of his work accomplished in Yucatan, and of the incomparable correctness and beauty of diction in which he clothed the report of it, we do so with the sincerest sentiment of admiration and gratitude. Read his visit to the island of Cozumel, that "resting place of immense flocks of birds" in *Incidents of Travel in Yucatan*, Vol. II, page 410.

of 1513 and Schoener, which represent it in the form of a large island connected with the cape, and with its name written right on its face.

The other name which is not translatable and which for reasons given we must suppose to be a word of native origin is that of *Canfuze*. Ruysch left the word out, and both the Ptolemy of 1513 and Schoener show it with the spelling of *Caninor*. As our map must always be considered to have the names more correctly spelled, we pass by the later form and try what can be made out of *Canfuze*. Here we observe that the letter which at first sight seems to be an *f* cannot upon closer inspection be so read. If compared with all the other *f*'s that occur on the map it is found to lack the characteristic flag-dash. If then we join the first stroke of the next letter *n* to the imperfect *f* we get the letter *p*, and with this emendation we come to a word carrying the sound of *canpize*, *kan-pech* in the native language, or Campeche as the large part of Western-Yucatan was afterwards called by the Spaniards. History tells us of the bloody encounters which on each attempt to land at Campeche Cordova as well as Grijalva and Cortes* had with the warlike cacique *kin-pech* (yellow-tick); and that the Portuguese met with similar opposition at this place appears to be clearly suggested by the name that follows the word *canpize*, which is *cabo d. li cōtu*, a somewhat abridged corruption of *cabo del incontro*, later on put down on the charts in the Spanish version as *Cabo de peleá*,

* Itinerario de Grijalva, in Coleccion de documentos p. l. historia de Mexico, by J. Garcia de Icazbalceta, Mexico, 1858, Tom. I, pages 291 and 292.—Bernal Diaz del Castillo, Hist. verd. d. l. conq. d. l. Nueva España, Madrid, 1632, Cap. 3 and 4 and Cap. 30 and 31.

which means the same thing. The identity of both place and name will be still more emphasized when we remember the fact that no river or creek empties into the sea on the whole way from Conil down to Campeche, and that the latter is the first spot at which fresh water is again to be had. It was just the necessity of having the empty casks filled with fresh water that gave importance to this spot and made it remarkable to the first navigators and discoverers.

But, it may be asked at this point, how does it come to pass that if the peninsula of Yucatan is meant to be represented by this long-stretched southern coast, the port of Campeche appears in latitude about 50° north of the equator, whereas its true position is in 20° N. Lat. and on the west coast of a three-sided peninsula? Our answer is that we do not believe King Joam's officers would have been bold enough to present him with the image of a disfigured survey, nor that the first copyist found the distorted outline on the Royal Marine Chart, nor finally that there is any truth in the suggestion oftentimes made that this coast is the representation of the eastern shores of North America; for if this were the case, the *cabo do fim de Abrill* would point its finger toward the island of Habacoa and would not stand directly west of the Cuban cape of San Antonio. No; we are of the firm belief that whenever tampering or deliberate misrepresentation is to be presumed, it must be laid at the door of the man who copied the chart and the responsibility for it must not be charged upon those experts who first surveyed this coast west of the island of Cuba.

When we consider the possible motive for this ex-

traordinary disfigurement, the choice lies between two explanations: either the draughtsman was expressly ordered to deliver the copy of the chart just in this prescribed form, or he drew it on his own authority for personal convenience.

There are reasons at hand which speak in favor of the first assumption. The expedition had been made at great expense and risk. The facts with regard to it were a part of the national record and the knowledge of it could not well be blotted out of existence. Similar considerations must have worked for the preservation of the chart. To destroy it would have been a vandalism and yet to keep this most precious document so well concealed that it should never come to light was very rightly deemed to be merely impossible. One resource there was: the chart might be so drawn as to mislead the intending copyist and the configuration of the coasts could be distorted to such a degree as to remain unintelligible except to those who possessed the key.

The second assumption that the copyist acted on his own authority seems to be the more acceptable one and to be based upon grounds of a less artificial character. It is more natural that reasons of economy prevailed with him. If he had drawn the body of the peninsula in the proportions given to him and at a distance of about 20 or 25 leagues from the Cape of San Antonio, he would have needed a sheet of paper or vellum much larger than any he had at his disposal. We should be glad to learn of any other imaginable reason for the disfigurement. But whatever the reason may have been, the fact is beyond dispute that the contours of the

peninsula in the original map were straightened out. We are able to follow the performance, step by step, and in this way to reconstruct, with a fair measure of accuracy, the body of the peninsula as it was originally drawn on the Royal Marine Map.

For this purpose let us take a piece of tracing paper and begin tracing the outlines from the *rio de las parmas* round *cabo do fim de Abrill* till we arrive at the *cabo Santo*. Here we stop and set the portion of the coast that follows at a right angle to the cape and trace it so. By this operation three sides of the coast are obtained. The next operation will be to give the diagram, at a measured distance from the cape of San Antonio, a quarter turn so that Cantino's south coast becomes the east coast of the peninsula. If now we look for *canpize* or Campeche, we shall find it at the place where it ought to stand on every chart of Yucatan and where consequently it must have been placed by the first surveyors, not in 50° but in 20° N. Lat. and on the west side of the peninsula.

There is an additional point that bears testimony to the correctness of our theory. All the names inscribed on the straightened coast exhibit themselves in a position contrary to what we should expect. They all stand upside down. This obvious anomaly has now found correction, because by bending the line into a peninsular body and by bringing this body into its natural position with regard to Cuba, the inscriptions also have been restored to their natural position. We find the names on the west coast, from *canpize* to *cabo Santo*, standing horizontally and upright, and those on the north coast, from *cabo Santo* to *cabo do fim de Abrill*, standing verti-

cally and upright, just as an expert draughtsman would have put them.

FINAL REMARKS.

The sudden rise of Portugal at the beginning of the XVth century to the foremost position as a maritime and commercial power in Europe was due to the extreme care taken by her rulers to cover with a veil of the deepest secrecy the objective points of their enterprises beyond sea, the improvements of their methods in navigation, and the results of their expeditions.

The Oceanic fleet which had been formed during the last five decades of the XVth century, might have been built and equipped and have found safe anchorage in many a port of the continental kingdom. But under such conditions every step in the preparations for a voyage would have been open to the inspection of a host of foreign speculators, merchants, agents and spies; and the Portuguese monarchs wisely established the royal navy yard in the distant Madeira. When it is considered that the communications afterwards maintained between this island and the naval station in the Bahamas not only involved a breach of treaty but were stained also with the reproach of piratical depredations committed on the Caribbean coast, it is not surprising that the sources of information concerning it and illustrative of our special subject should be very scanty at this day after the lapse of nearly four hundred years.

Should the official report of the admiral in command of the surveying fleet ever come to light—a thing hardly to be expected—the account of the discovery of the

peninsula and the incidents connected therewith, would not differ much in substance from that given twenty or thirty years later by Cordova, Grijalva and Cortes. On the other hand even the driest historical narrative of this Portuguese expedition must glow with life and color, when touched by the imagination. We have only to bring before our mind's eye the array of all the startling occurrences that must have happened to a little fleet engaged in the task of operating stealthily under the very eyes of the enemy—the constant peril of detection, the exultation of escape, the continued strain of vigilance, the Punic rigor of discipline that weighed upon the mind and body of every man and the stern duty of absolute silence that sealed the lips of each actor in this drama of national vengeance and political perfidy.

It seems to be the result of an almost incredible neglect that in the course of the twenty-four years since the discovery of the Antilles no Spanish vessels except those under Cordova's command (1516) attempted to steer to the west of Cuba so as to strike the continent at or near Cabo Catoche. A few days sailing still farther to the west would have brought the seamen to a land of wealth and civilization. This lack of enterprise the Spanish nation had to pay for with the loss of a whole generation, and the burial of the bodies of her best sons along the inhospitable shores of the Caribbean Sea. For once settled in St. Domingo, they followed the drift of exploration backward to the east, meeting on that long-drawn curve with nothing but the wilderness of stagnant mangrove swamps and the spears and poisoned arrows of the Guajiquiro Caribs and the Darien savages.

We cannot take leave of our subject without making

mention of a curious circumstance connected with the Cantino chart. When we look at the left marginal line, where to the west of the *Cabo do fim de Abrill* a large cluster of islands is represented, we find that the line passes through the midst of an island and through a half-drawn indentation of the coast. That at this place something is missing in our copy which was represented on the original chart, becomes evident when we examine the three maps published in 1508, 1514 and 1520. Ruysch, as will be observed, brings out at this place a full curve and the line of the tropic of Cancer is drawn through two islands, which are inscribed *C. S. Marci*, while north at the beginning of the curve we find the name *Lago de Loro*. The same curve and islands appear still more distinctly drawn in the Ptolemy of 1514, the curve showing an additional gulf and the inscription as in Ruysch but with the spelling *lacco dell odro*. Schoener also shows the curve and the islands but drops the names, and adds to a southerly prolongation of the curve the inscription *Paria*.

Now, since we have not the slightest doubt that these three maps, as well as the Cantino, are copies taken either at first or second-hand from the original Portuguese marine chart, we must feel a measure of indignant grief at the irreparable damage done by the idle hand that trimmed away the worn edge of the map, and so kept us from learning with precision what other inscriptions the original chart exhibited at this place. For, in one word, the piece cut off must have contained on a large scale, the representation of the coast of Northern Honduras. The *lacco dell odro* *represents the modern

* In translation: the bag-gulf, in Spanish *el odre*, the wine-bag, made of goat-

Golfo Dulce, and the *Cabo St. Marci*, indicated on the the three maps by islands lying in a delta, is the tract of coast which greets us in the same peculiar shape and in the same place on all the maps of the ensuing centuries, inscribed with the name *Cabo de tres puntas* (to day cape *Manabique*) and followed by the headland of the *plains of Sula*, the alluvial product of various small and the two large rivers, the *Ulua* and the *Chamelcon*, the *triquestre* of the Vaz Dourado atlas. As far as this point the Portuguese appear to have extended their survey.

One of the results of our examination of the Cantino chart has been to learn that Portuguese skill and marine enterprise succeeded in discovering the shores of the new continent before Christopher Columbus. But it is not our purpose to view this interesting fact in this light alone or to emphasize it to the gratification of those who try to remove the Admiral from the lofty pedestal on which admiring and grateful posterity has placed and will sustain him.

Columbus was and will continue to be the man of the first and the great deed; for, as Goethe says, "a man was needed, who had the power to seize with firm and intellectual grasp all that was fable and fact, tradition and error, and to stamp these like coin into palpable reality." The Portuguese discoveries in the Castilian waters were of inglorious origin, their management and conduct and consequences had to shun the open daylight and the final result, though not without signific-

skin, in which since the appearance of the god Bacchus on the Mediterranean shores, the vintagers down to the present time have kept their wine. The name springs from the mariner's coarse imagery and perfectly reflects the contours of this gulf with its strangulated outlet into the bay of *Amatique*.

ance, was a fruitless one. We are to remember that this chart gives the first delineation, offered to European eyes, of any part of the gigantic continent. Rediscovered Yucatan afterwards received from the Spaniards the nomenclature left by the Portuguese, and we cannot doubt that when copies began to be multiplied, some one of these early charts of the peninsula served to guide Cordova, Grijalva and finally Hernan Cortes to the golden gates of Montezuma's empire.

On our modern maps the western end of the northern coast shows no salient cape. It curves smoothly to the south, where at a certain distance the sea has again made an inroad, broad and deep, the entrance point of which to-day is called *la punta desconocida*, while the estuary itself is known by the name, *el Real de las Salinas*. It was the logic of these successive features, taken in connection with the arrow-head drawn on the Cantino chart by the copyist, that suggested the bending of the coast line at this place in order to obtain the genuine shape of the peninsula. By doing this we restore the *rio de los lagartos* to its natural direction which is from the south to the north, and are thus enabled to identify this supposed river with the estuary *de las Salinas* and the *Cabo Santo* with *punta desconocida*. To the south of *punta desconocida* the modern maps give to this tract of the west coast the name *bocas de Chizahcab* (*transl.* strong-water-push). These *bocas* or breaks undoubtedly answer to those which at the same place on the Cantino chart are called *las Cabras*, or better *las abras*, *i.e.* openings, and that we are correct in our demonstration is shown by the circumstance that opposite these *abras* the chart has the mark for a reef, which in location, distance,

and loneliness exactly corresponds to the *la Piedra Island* of the modern maps.*

These small *bocas* are followed by two larger ones, the names of which are given in the modern maps as *boca de Xaina* and *Lumpolol*. Both these interesting features were observed by the ancient pilots. The first one is left without a name, the other bears that of *Lago luncor*.

Down to this point the eye of the navigator is fatigued by the melancholy aspect of a barren coast, but as Campeche is neared there begins to appear in the distance like a blue cloud rising from the ground a range of soft rolling hills, at the foot of one of which nestles the city of Campeche. This sudden change of landscape has found expression in the name *costa alta*, left to this region. After a few hours' further sailing the hills come closer and closer to the water, no intervening strip of level land is left; the dark form of a hill about 420 feet in height rises on the very brink of the waves, like a lofty citadel, commanding the beach as well as the approach from the sea. This conspicuous promontory, *punta Seiba* or *punta de los morros* of to-day, must have been in some way of good augury to our Portuguese, for they gave it the name of *Cabo de boa ventura*. The river farther to the south is the *Champoton*. At its mouth it is dull and almost stagnant, for it has no perceptible current, but its area of drainage extends as far as to the very centre of the peninsula. At the time of the Conquest it furnished in this land of drought the means of life to a dense population.† The Span-

* A visit has been lately made to this little island by Mr. Désiré Charnay, the industrious explorer of Yucatan. See for description and illustrations: *Le Tour du Monde, Paris, 1887, Vol. 53, Page 320.*

† Scenery and incidents at Champoton are described in a lively manner by Ber-

iards vainly endeavored to take possession of this artery of life and settle down in Champoton. They had to yield to the unceasing onslaughts of the formidable Canpice, *Kin-Peck* (yellow-tick) and his tribe, and to change the much-desired site of a well-watered harbor at Champoton for that of Campeche, further north. It seems as though these first Portuguese explorers had met further on with similar resistance. When they reached *punta Jovinal*, a little to the south, they named the spot *cabo del in contro*, to record an encounter with the people of *Kin-pech*.

The inscription *Costa del mar vaçano* (ocean) being the last met with on the map, we are to suppose that the explorers did not further pursue their course, and here turned back.

Not one of the physical features that characterize the three coasts of the peninsula of Yucatan escaped the attention of the Portuguese pilots.

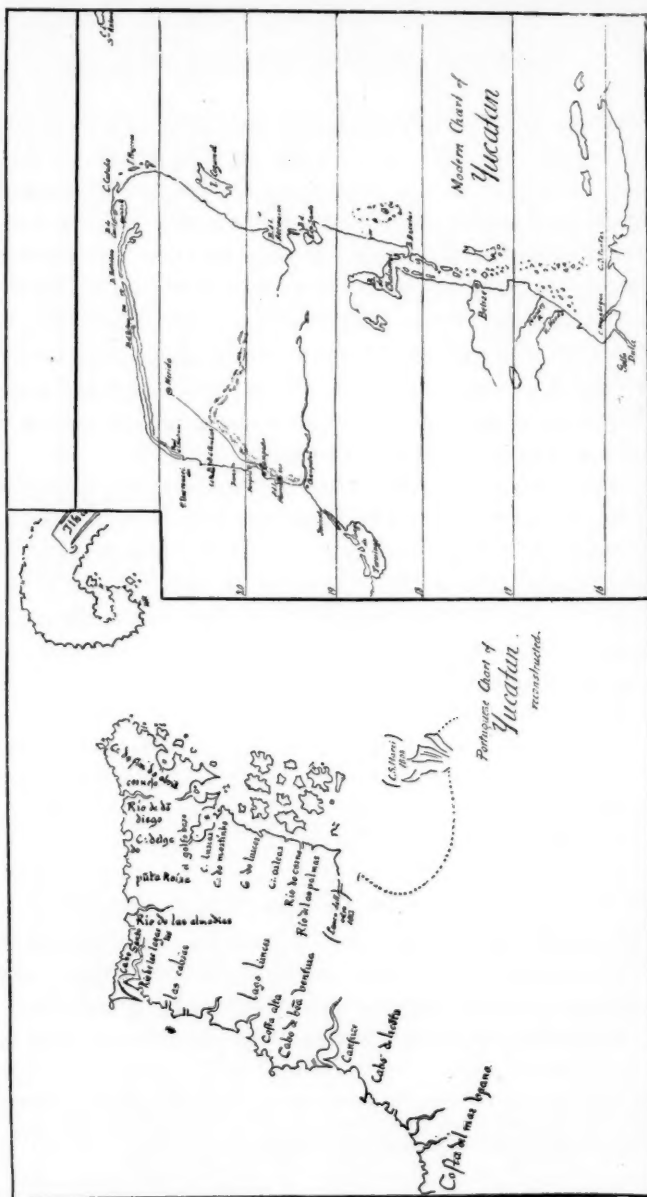
VII.

IDENTIFICATIONS.

A definite solution of our problem is arrived at when we see before us the evidence that the reconstructed chart not only bears all the characteristics proper to the physical features of Yucatan with its three coasts, but presents them all in their natural order of succession.

To facilitate the comparison, the map shows, side by

nal Diaz, the companion of Grijalva and Cortes, in his *Hist. verd. d. l. Conq. d. l. N. Esp.* Chapters 3, 4, 5. On the same read also *Elegio Ancona*, *Hist. de Yucatan*, Merida, 1878, Vol. I., from page 205-324.



side, the Portuguese chart and the modern chart of Yucatan.

Some allowances must be made. The ancient map will be found defective in a certain degree, with regard to measurement and relative proportions. It will be found that some peculiarities of the coast which excited the sailor's interest are rendered in disproportionate dimensions, while others not so significant are treated, as happens in all first surveys, with less attention.

Let us look, first, at the islands that skirt the eastern coast.

Beginning at the south we meet on the Cantino chart a large number of islands grouped near the coast. These were undoubtedly intended to represent all those islands which on the modern map are seen stretching from the island of *Tabaco* (Glover reef) upward to *Bacalar*, and parallel to the coast now known by the name of *Balize*. Farther up, beneath the *cabo do fim de Abrill*, is a large island painted in violet color and standing drawn at a proportionate distance from the coast. This can be no other than the famous *Cozumel*. The marks for reefs and shoals near by the cape correspond with those little islands, to-day comprised under the collective name of *islas de las mujeres*.

As to the *bays* of the same coast the modern map shows three, all of considerable dimensions, but differing in form. The lowest one, that of *Chetumal*, which is a kind of twin bay, and cuts deep into the coast, corresponds with the one marked on the ancient chart as *golfo baxo*, the deep gulf, its twin-nature having been noticed by the sharp-sighted explorers. The two following bays, *Espiritu Santo* and *Ascension*, are also seen on the

Cantino chart, but are left without names. Of the capes on the *golfo baxo*, the one at the entrance bears on our map the name *Mortinho*, the inner one that of *lurcar*. In the first we are justified in recognizing the present cape of *Balize*, in the other the *punta de la piedra*.

The rivers *de las palmas* and *do corno*, in the south, are drawn at places where to-day we find the mouths of the *Rio hondo* and the *Monkey-river*.

Upon approaching the *cabo do fim de Abrill*, of which we entertain no doubt that it was intended to represent the actual *cabo de Catoche*, the coast of the peninsula begins to trend toward the west. In order to make this important circumstance more conspicuous, the draughtsman seems to have taken care to provide this turning point with the sign of an arrow-head, a suggestion to be turned to profit in case of re-occurrence.

Let us now proceed to the examination of the north coast of Yucatan.

Its physical aspect is monotonous to the last degree. It shows a long stretch of beach, unbroken by any bay or mountain slope. For the whole distance, from east to west, the front is bordered by the line of an unattractive wall of sand, open only at three places. In the east is the break that forms the bay of *Yalahau*, and not far west from this and connecting with it that of *Holkobén*. The third break is that known by the now obstructed *boca of Uilam* (U=ds). The sea rolls in and out of these *bocas*, and fills or empties the estuaries lying behind the wall. Notwithstanding the continuous motion of the tides these estuaries are of smooth water, and as they run parallel to the beach they afford safe anchorage and a welcome means of inner navigation to the small craft of

the native boatmen. Seen from on board a vessel, out at sea, these breaks present the aspect of mouths of rivers, and this impression must have led the Portuguese navigators to give to the two neighboring breaks that form the bay of Yalahaú the collective name of *Rio de dô Diego*, while the break at *Jilam* received the name *Rio de las almadias*.

Between these two breaks or rivers on the north coast, our ancient chart names only two capes, *cabo delgado* and *punta roixa*. In reality, they have nothing of a conspicuous promontory. They are rather big natural jetties of sand protruding from the beach into the ocean, but not without significance to coasting ships, because they are the only landmarks along the straight and barren coast and are to be avoided on account of their shoals and the eddies originated by the deflected current. On the marine chart we find for them the names *punta Holchan* and *punta Yalkubul* (marked on the map *P.H.* and *P.Y.*)

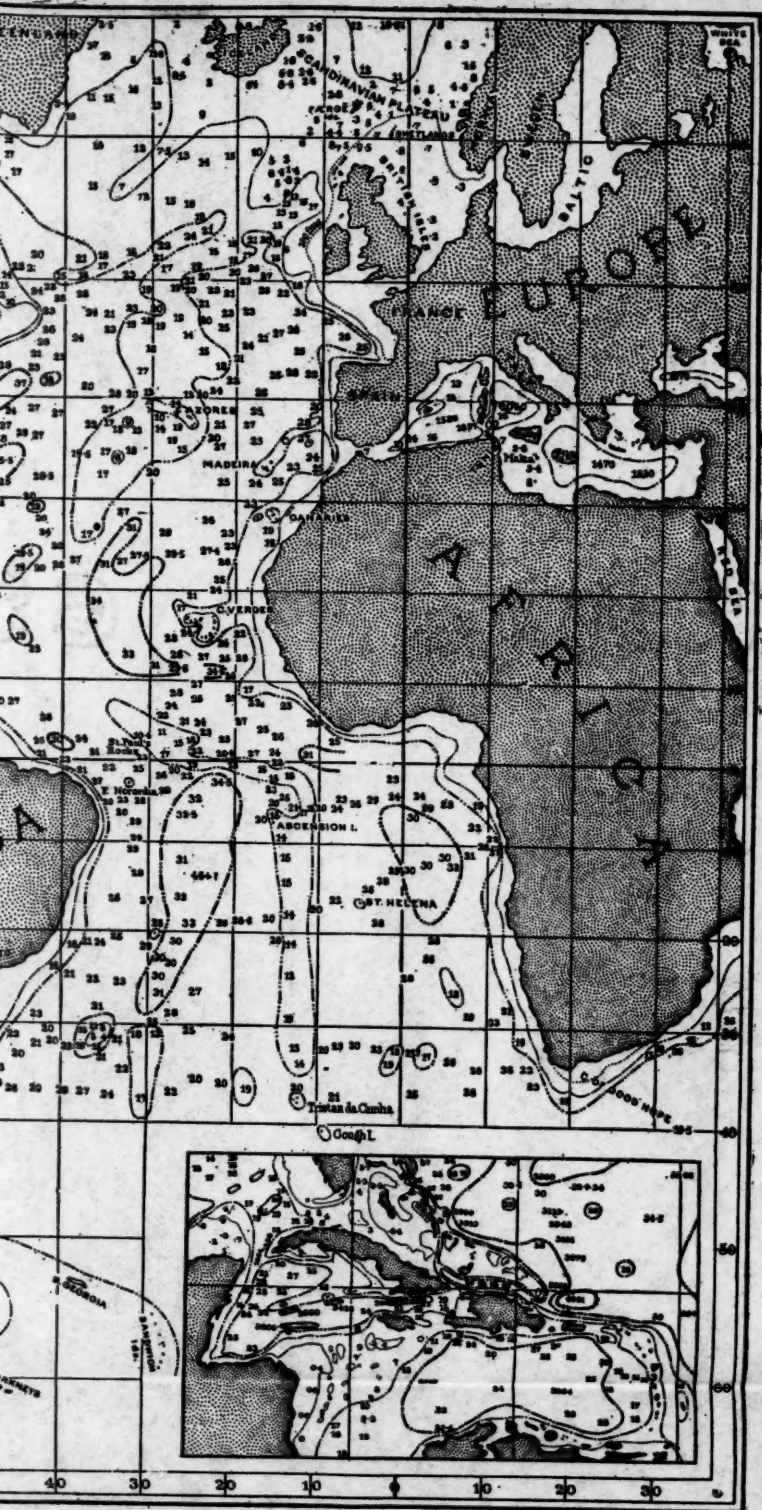
GEOGRAPHICAL NOTES.

THE DEEP TROUGHS OF THE OCEANIC DEPRESSION.—Prof. James D. Dana, in the *American Journal of Science*, for March, 1889, discusses the subject of the deep troughs of the oceanic depression, with a general conclusion against their supposed volcanic origin. No more than this is possible, he remarks, in the absence of an accurate map of the heights and depths through all the great area. The paper is illustrated by a bathymetric map (here reproduced), with accompanying explanations. In the preparation of the map Prof. Dana used the charts of the Hydrographic Departments of the United States and Great Britain and the lists of new soundings given in German and other geographical journals.

In order that the facts on which the bathymetric lines are based may be before the reader many of the depths are given, but in an abbreviated form, 100 fathoms being made the unit; 25 signifying 2,500 fathoms or nearly (between 2,460 and 2,550); 2.3, about 230 fathoms, .4, about 40 fathoms. Only for some deep points is the depth given in full. The addition of a plus sign (+) signifies no bottom reached by the sounding.

Some divergences from other published bathymetric maps are explained. The northern half of the North Pacific is generally made part of a great 3,000 fathom





area (between 3,000 and 4,000), stretching from the long and deep trough near Japan far enough eastward to include the soundings of 3,000 fathoms, and over in mid-ocean along the 35th parallel. Prof. Dana thinks it more reasonable to confine the deep-sea area off Japan to the border-region of the ocean, near the Kurile and Aleutian Islands, and leave the area in mid-ocean to be enlarged as more soundings shall be obtained.

Again, in the South Pacific, west of Patagonia, the area of relatively shallow soundings (under 2,000 fathoms) extending from the coast, is usually bent southward at its outer western limit so as to include the area of similar soundings on the parallel of 40° and 50° , between 112° and 122° W. The prevailing trends of the ocean are opposed to such a bend, and Prof. Dana does not adopt it. In the Antarctic Atlantic a large area of 3,000 and 4,000 fathoms has been located about the parallel of $66\frac{1}{2}^{\circ}$ S. and the meridian of $13\frac{1}{2}^{\circ}$ W. The authority for this was a sounding made in 1842 by Capt. Ross, R. N., who found no bottom with a line of 4,000 fathoms. The means available at the date given were not "sufficient to ensure the accuracy of such deep casts."

In a bathymetric map the trends in feature-lines are the trends of the great mountain ranges themselves, and, in the Pacific, these mountain courses are those of half a hemisphere.

Prof. Dana states briefly some of the deductions from such a map:

1. Over the Pacific area there are *no* prominent north-and-south, or meridional courses in its ranges, and

none over the Atlantic, except the axial range of relatively shallow water in the South Atlantic. There are none in the great ranges of Asia and Europe, excepting the Urals; none in North America; none in South America, excepting a part of those on its west side.

2. The ranges in the Pacific have a mean trend of not far from northwest-by-west. One *transverse* range crosses the middle South Pacific, beginning to the south in New Zealand and the islands south of it, with the course N. 35° E., and continuing through the Kermadec Islands and the Tonga group, the latter trending about N. 22° E.

3. The oceanic ranges are rarely straight, but change gradually in trend through a large curve or a series of curves, and the intersections of crossing ranges, curved or not, are in general nearly rectangular.

4. Approximate parallelisms exist between the distant ranges or feature-lines; as (1) between the trend of the New Zealand range and that of the east coast of North America; and also that of South America (continued across the ocean to Scandinavia); also (2) between the trend of the foot of the New Zealand boot with the Louisiade group and New Guinea farther west, and the mean trend of the islands of the Central Pacific and that of the north shore of South America.

5. The relatively shallow-water area which stretches across the North Atlantic from Scandinavia to Greenland is continued south-westward in the direction of the axis of the North Atlantic and becomes the "Dolphin shoal."

It is suggested that it may be a correlate fact that a Patagonian plateau stretches out from high southern lat-

and in a note Prof. Dana calls attention to the parallelism between the Mediterranean Sea and the West India (or West Mediterranean) Sea that divides North from South America. Both these seas have an *eastern, middle* and *western* deep basin.

Their depths are, in the Mediterranean, 2,170, 2,040 and 1,585 fathoms; in the West Mediterranean (the three being the Caribbean, the West Caribbean or Cuban, and the Gulf of Mexico), 2,804, 3,428 and 2,080 fathoms. Further, in each Mediterranean Sea, a shallow-water plateau extends from a prominent point on the south side, northward, to islands between the eastern and middle of the deep basins; one from the northeast angle of Tunis to Sicily, the other from the northeast angle of Honduras to Jamaica and Haiti, the two about the same in range of depth of water.

The general truths illustrated by the map are: that system in the feature-lines is a fact; that the system is world-wide in its scope; and that it had its foundation in the beginning of the earth's genesis and was developed to full completion with its growth.

Facts which favor the volcanic origin of the troughs are:

1. The existence of the depressions in the close vicinity of the Hawaiian Islands, one 3,023 fathoms deep to the northeast of Oahu and another 2,875 fathoms deep east of Hawaii; besides a trough 450 miles northeast of Oahu with a depth of 3,000 to 3,540 fathoms, and another, as far south, with soundings of 3,000 to 3,100 fathoms.

2. The depth of 4,475 fathoms found by the *Challenger* off Guam, the largest island of the volcanic Ladrões, in the western North Pacific.

3. The fact that east of Japan and the Kuriles, a region of ranges of volcanoes, there is the longest and deepest trough of the ocean, the length 1,800 miles, the depths 4,000 to 4,650 fathoms; while farther northeast, south of one of the Aleutian islands, a depth of 4,000 fathoms occurs again, and still farther east depths of 3,100 to 3,664 fathoms are found.

On the other hand there are striking examples of the absence of deep troughs from the vicinity of eminently volcanic regions. With the exception of a short trough with soundings of 3,000 to 3,368 fathoms close to the Peruvian shore, the depth of the ocean off the western border of North and South America is between 2,000 and 2,700 fathoms, and just south of Valparaiso it shallows to 1,325 fathoms. It deserves consideration, however, that the waters of this border of America deepen abruptly compared with those of the Atlantic side.

Off Central America where the volcanoes are quite near to the ocean, the depths are between 1,500 and 2,500 fathoms. The condition is the same off the west coast of North America.

In the North Atlantic the North American side has larger areas of deep water and much greater mean depth than the European side with its volcanoes. The volcanic Azores have depths around them of only 1,000 to 2,000 fathoms and no troughs. Iceland is in still shallower waters; and the Canaries, though volcanic, have no deep trough near them. Many of the deep areas in the Pacific are so situated that no reason is apparent for referring them to a volcanic origin. The seven 3,000-fathom areas of the Atlantic occupy positions that suggest no relation to volcanic conditions.

A possible volcanic origin is admitted for the depression of 2,445 fathoms 40 miles west of the Cape Verde Archipelago and for that of 2,060 fathoms within 20 miles of Ascension Island. The most remarkable depths of the Atlantic are in the West Indies, the deepest trough, 4,561 fathoms, being within 70 miles of Porto Rico, an island which has no great volcanic mountain. North of the Bahama belt of coral reefs and islands, the depth becomes 2,700 to 3,000 fathoms within 20 miles of the coast line, and at one point 2,990 fathoms within 12 miles and there is nothing to suggest a volcanic cause for the descent.

Prof. Dana holds the opinion that the arrangement of the deep sea troughs in the two halves of the oceans points to some other than a volcanic origin. The *western* half of the Atlantic and Pacific oceans contains much the larger part of the 3,000-fathom areas and all the depths over 4,000 fathoms. Viewed as a whole, the Pacific may be said to have a westward slope in its bottom or from the South American coast toward Japan. This slope exists even in the area between New Zealand and Australia. In the Atlantic, the slope is in the direction of its northeast-northwest axis, either side of the Dolphin shoal, but especially the western side, rather than from east to west. Owing to the system in the Atlantic topography, the Dolphin shoal—the site of what Prof. Dana unkindly calls the *Atlantis* of “ancient and modern fable”—is really an appendage to the eastern continent, that is to Europe, and is shut off by wide abyssal seas from the lands to the west.

It is to be noted that in the Indian Ocean the greatest depths are found in the *eastern* part, off the

northwest coast of Australia and near western Java and Sumatra.

THE FOURTH CENTENARY OF THE DISCOVERY OF AMERICA.—The Madrid *Real Academia de la Historia* has made public the following programme of an International Competition for 1892 :

A competition is opened to solemnize this great occasion by a literary monument that shall endure and record it.

The work must be a composition in prose, a judicious historical picture, that shall correctly set forth the greatness of the event which is to be celebrated.

From the beginning of the sixteenth century to the present day so much has been said upon this subject that it seems difficult to write anything new and good.

With regard to details, perhaps, and the circumstances of the life and acts of Columbus, there remains not a little to be investigated, but the Royal Academy of History is already busied with this task of erudition and diligence in the collection and publication of documents previously unpublished, or not widely known.

The book now proposed for competition must be of a different order. It must be comprehensive and compendious, and sufficiently concise, without becoming dry or obscure.

In the abundance of works on the history of America, on voyages and discoveries, on the science of geography and the European establishments in the most distant regions of the world, there is no one book that sets in its proper light the combined action of the nations of the Iberian peninsula in the sixteenth century, when

they carried out in a hundred years of unexampled effort, with firmness of purpose and astonishing steadiness and tenacity, the exploration of vast islands and continents, and crossed oceans never before ploughed by the keels of a Christian people, and gained in their rivalry with each other an almost complete acquaintance with the planet on which we live.

In this work there is a progressive interest, as well as a manifest unity. Passing over the indications afforded by some maps, such as the Catalan of 1375, and by half-fabulous voyages like those of Doria and Vivaldi and by others better authenticated, but still isolated and without result, like that of Ferrer, this unity, in what it contains of most important, begins with 1434, when Gil Eannes doubled Cape Bojador, discovered Guinea and dissipated the terror that brooded over the dark ocean, and ends with 1522, when Elcano arrived at San Lúcar after having sailed around the world.

In all this action but little was left to chance. The progressive series of geographical discoveries, due to persistent forethought and not to accident, finds its origin at Sagres with Prince Henry the Navigator and his illustrious pilot, Jaime de Mallorca.

From that time until the form and the magnitude of the terraqueous globe became clearly known, Pedro Núñez might well boast that nearly every result had been obtained, not by following mere conjecture, "but because our navigators went well instructed and provided with instruments and with rules of Astrology and Geography, things not to be dispensed with by cosmographers."

The culminating point in the development of this

beautiful history is reached on the 12th day of October, 1492, when Columbus was the first European to set foot on the intertropical soil of the New World; but this event, beyond the significance it has, when considered in itself alone as an effect of the individual inspiration of a seaman and of the generous enthusiasm of the queen who protected him, is found to possess a higher meaning when taken in conjunction with the entire action, and with the unfolding of the design to explore the whole globe and to extend everywhere the law and the name of Christ with the civilization of Europe, no less than to take possession of the gold and spices and riches of every kind, known only by costly specimens and exaggerated reports, furnished by the Venetian and Genoese and Catalan traders into whose hands these products were delivered by the Mohammedans.

Undoubtedly the force which moved the men of our peninsula to an enterprise like this was the resultant of whatever great sentiments, evil and good, are to be found in the heart: religious fervor, thirst for glory, ambition, Christian charity, greed, curiosity and eagerness to penetrate the unknown, and, above all, the longing, in the full day of the Renaissance, to seek and to encounter real adventures that should eclipse the fantastic, vain and aimless stories of the books of chivalry, and to accomplish voyages and conquests that should surpass those of the Greeks and the Romans and the fables of classical antiquity, then freshly revived by scholars and made familiar to all men.

What is to be written is the complete representation of all this enterprise, so that its vast significance may be distinctly seen without in any way lessening the convic-

tion that the conceptions, the marches and the voyages and the successful daring of Bartolomé Diaz, Gama, Albuquerque, Cabral, Balboa, Magellan, Cortés, Pizarro, Orellana, and so many others, far from diminishing the glory of the hero whose centenary is to be celebrated, do but serve to heighten it ; and to display in its most luminous aspect the work of civilization, in which Portugal laid the foundation, while Castile, with Columbus, bore the principal and the most arduous part, and all Spain gave to the task its fitting conclusion by opening the strait that bounds the American continent, and crossing for the first time an ocean mightier than the Atlantic and circumnavigating the globe.

The book, thus dimly outlined, must present in a compendious introduction notices of voyages, ideas, and geographical advancement up to the establishment made by Prince Henry the Navigator at Sagres ; and must close with a more extended conclusion, in which shall be considered and estimated the changes and the ameliorations that have been the consequence of our collective work ; in commerce, in the economical and political condition of the peoples, in the broad field thrown open for the spread and the domination of the intelligent European activity, in the abundance of facts observed and hopes well-founded, and in the more certain basis afforded to scholars and scientific men for the better understanding of Nature, the penetration of her mysteries and the unveiling of her laws.

The elevation and magnitude of the subject require that the book shall be a finished work of art, not as regards richness and ornament of diction, but as to the arrangement of the plan and the sobriety

and purity of style, which must owe its nobleness and beauty to the clearness of the language, the correctness of the judgment and the sustained force of the thought.

Any unpublished work, written especially for this occasion in Spanish, or Portuguese, or English, or German, or French, or Italian, may be sent in for competition.

The award will be made by a Tribunal composed of two members of the *Real Academia de la Historia*, and one member of each of the following Academies: the *Real Academia Española*, the *R. A. de Ciencias morales y políticas*, and the *R. A. de Ciencias exactas y naturales*, the members to be chosen by the respective Academies; and a seat in the Tribunal shall belong to the diplomatic, or specially designated, Representative of every Power, a subject of which shall present through him a book for the competition.

The Tribunal shall elect its own President and shall render its decision upon the works submitted by absolute majority of votes of those present at the time of voting.

The works submitted must be neatly bound and written in a legible hand on good paper, without the author's name, and inscribed with a motto.

The same motto and the first phrase of the work shall be written upon the outside of a sealed envelope, which shall contain in each case the name and the residence of the author.

The sealed envelopes, identifying the works which do not obtain a prize, shall be publicly burned unopened.

Although it is difficult to assign an exact limit to such a work, it ought not to exceed the reading matter contained in 2 volumes of 500 pages each, of the size and type of the complete works of Cervantes, edition of Rivadeneyra, 1863 and 1864. (This edition is an imp. 8vo, with about 450 words to the page.)

Nevertheless, as some margin must be allowed, there may be added to the text, if the plan or the development of any one of the works requires it, a supplementary volume of documents, maps and other illustrations.

In order to afford time for examination and judgment, the works intended for the competition must be delivered to the Secretary of the *Real Academia de la Historia* before the 1st of January, 1892.

There will be a first prize of 30,000 pesetas (\$5,625) and a second prize of 15,000 pesetas (\$2,812.50). In addition to these, each author will receive 500 copies of his work when printed.

It will be for the Committee on the Centenary to determine the number of copies of which the edition of each work shall consist, and the disposition to be made of the copies not delivered to the authors.

The authors shall retain the right of property in their works, and the right to reprint them, to sell them and to have them translated into other languages.

The Committee, however, reserves the right if the award shall be made, in either or in both cases, in favor of works written in a foreign language, to have these translated and published in Spanish.

The preceding conditions are given to the press by the Committee for the information of the public, and for

the guidance of those who may desire to take part in the competition.

MADRID, June 19th, 1889.

DUQUE DE VERAGUA,
Vice-President.

JUAN VALERA,
JUAN F. RIAÑO,
Secretaries.

THE ROYAL SOCIETY OF NEW SOUTH WALES offers its medal and a money prize for communications on the following subjects :

SERIES IX.—*To be sent in not later than 1st May, 1890.*

No. 31.—The Influence of the Australian Climate (general and local) in the Development and Modification of Disease. The Society's medal and £25.

No. 32.—On the Silver Ore Deposits of New South Wales. The Society's medal and £25.

No. 33.—On the Occurrence of Precious Stones in New South Wales, with a Description of the Deposits in which they are found. The Society's medal and £25.

SERIES X.—*To be sent in not later than 1st May, 1891.*

No. 34.—The Meteorology of Australia, New Zealand and Tasmania. The Society's medal and £25.

No. 35. Anatomy and Life History of the Echidna and Platypus. The Society's medal and £25.

No. 36.—The Microscopic Structure of Australian Rocks. The Society's medal and £25.

The competition is in no way confined to members of the Society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the Council

for the time being ; neither will an award be made for a mere compilation, however meritorious in its way. The communication to be successful must be either wholly or in part the result of original observation or research on the part of the contributor.

The Society is fully sensible that the money value of the prize will not repay an investigator for the expenditure of his time and labor, but it is hoped that the honor will be regarded as a sufficient inducement and reward.

The successful papers will be published in the Society's Annual Volume. Fifty reprint copies will be furnished to the author free of expense.

Competitors are requested to write upon foolscap paper—on one side only. A motto must be used instead of the writer's name, and each paper must be accompanied by a sealed envelope bearing the motto outside and containing the writer's name and address inside.

All communications to be addressed to the Honorary Secretaries.

37 Elizabeth Street, Sydney. A. LIVERSIDGE,
F. B. KYNGDON,
Honorary Secretaries.

LAKE CHAMPLAIN.—In Appendix No. 7, Report of the U. S. Coast and Geodetic Survey for 1887, Mr. Charles A. Schott makes a preliminary report on the fluctuations in the level of Lake Champlain, and the average height of its surface above the sea.

The average elevation of the lake, as given by various authorities up to 1887, was generally confined within the limits of 90 and 100 feet, and there was no great error in any one estimate.

With the data at command, Mr. Schott fixes the height above the mean sea-level at 29m.618, or 97.17 feet.

The statements as to the greatest depth of the lake show a wide discrepancy between 252 feet, accepted by some authorities, and 600 feet, as given in Lippincott's *Gazetteer* (1882). The deepest sounding made by the Coast Survey in 1870-74, and published in 1879-80, was 399 feet, off Wing's Point, in lat. $44^{\circ} 18'$, long. $73^{\circ} 19'$. Mr. Schott finds reason for adding 3 feet to this result, and fixes the depth at 402 feet; more than 300 feet, that is to say, below the level of the Atlantic Ocean.

The irregular, periodic, and secular variations in the lake level as observed during twelve years, indicate a *total* range of 8 feet at the northern outlet, and no doubt this range is greatly exceeded at points near the opposite extremity under the influence of strong and continuous northerly winds. (By *secular* variations Mr. Schott seems to mean the variations for the period during which observations have been made.)

The mean variation, according to 12 years' observations, from 1871 to 1882, was 2.64 feet, and the annual observations showed that the lake level was highest in May and lowest in October.

CLIMATOLOGY OF PENNSYLVANIA.—The Annual Report of Thos. J. Stewart, Secretary of Internal Affairs of Pennsylvania, for the year ending Nov. 30, 1888, includes a paper covering more than 200 pages on the Climatology of the State, by Lorin Blodgett.

Observations at 180 stations are given for periods

varying from a few months at some to a continuous record of 69 years at Morrisville, Bucks County.

For Philadelphia, the independent reports number 22, many of them, of course, contemporary and aggregating 300 years.

The study of these records reveals, according to Mr. Blodgett, a perfect symmetry in the curves of temperature. In all cases the minimum is in January, and later than the middle of the month. January is 3° colder than December, and February is $1^{\circ}.5$ warmer than January. In the colder parts of the State, March is a full winter month, with a mean of 30° , while at Philadelphia, Lancaster and Harrisburg, the mean for March is 40° .

These three cities typify the climate of the southern part of Pennsylvania.

The spring months should include June, and from April to June the increase of heat is 10° for each month over the preceding month. In many cases the March mean being near 40° , that for April is 50° to 51° , that for May 60° to 62° , and that for June 70° to 71° .

The declining side of the thermal curve shows a fall of 3° from July to August, one of 6° from August to September, and one of 11° , each, from September to October and from October to November. From November to December the fall is 10° .

Mr. Blodgett's paper is illustrated by a map showing the isothermal lines and the elevations above tide-water.

INFORMATION REGARDING THE GEOGRAPHY OF MINNESOTA.—The Minnesota Historical Society of St. Paul, under date of July 12, 1889, calls attention to the following Act of the Legislature of the State :

(H. F. No. 702.)

AN ACT TO FIX THE NAME OF A LAKE
FORMERLY KNOWN AS ELK LAKE.*Be it enacted by the Legislature of the State of Minnesota :*

SECTION 1. That the lake known for many years to the Indians and early explorers as Elk lake, situated in Beltrami county, in section twenty-two (22) of town one hundred and forty-three (143) north, range thirty-six (36) west, fifth principal meridian, shall be known and designated hereafter on all official maps of the State, and named in all county and State records referring to the same, as "Elk Lake."

SEC. 2. No edition of any school geography, published subsequently to January one, eighteen hundred and ninety, which contains any map giving any name to the lake specified in section one other than "Elk lake," shall be used in the schools of this State.

SEC. 3. This act shall take effect and be in force from and after its passage.

Approved April 24, 1889.

It is added that the action of the Legislature was "occasioned by the fact that one Willard Glazier had (in 1881) endeavored to have the name 'Elk Lake' changed, and called for himself, and he issued maps with his name on them, and also prevailed on map publishers to make the same change. Such changing of the name of Elk Lake was without any sanction of authority, and is not recognized by the people of the State, as the passage of the above act evinces." This should dispose of Capt. Glazier, but many things that should be are not.

THE NAME OF AMERICA.—M. L. Gallois, professor of history and geography at Lyons, writes in the September *Bulletin* of the Lyons Geographical Society a brief criticism of Mr. Jules Marcou's *Nouvelles Recherches sur l'Origine du Nom d'Amérique*. M. Gallois remarks that the true name of the mountains, which Mr. Marcou calls the *Amerrique* range, is *Amerrique*; that there is no reason to believe that Vespucci ever saw the coast of Nicaragua; that Vespucci's name was *Amerigo*; and that Waldseemüller's positive statement in the *Cosmographiæ Introductio* that he took the name he gave to America from the name of Vespucci must be accepted.

Mr. Marcou denounces Waldseemüller as "a block-head, a mere salaried assistant, occupied in the preparation of maps for a new edition of Ptolemy, and in proof-reading in the printing establishment of the Luds."

At this rate, asks M. Gallois, what is to be said of Erasmus, who did not disdain to correct proofs for his friend Froben? And who can believe that the Ptolemy of 1513 was produced by the first man that came along?

Mr. Marcou first published his hypothesis in 1875. "He tries now," says his critic, in conclusion, "to support his theory by facts; but this he ought to have done in the beginning. The Paris Geographical Society, fortunately, does not make itself responsible for the opinions which it prints, but we must regret that it was generous enough to give up eighty pages of its *Bulletin* to this fantastic paper."

THE YUKON DISTRICT.—Among the recent publications of the Geological and Natural History Survey of Canada is Dr. George M. Dawson's report on his ex-

ploration of the Yukon District and the adjacent northern portion of British Columbia. The region is bounded to the south by the 60th parallel of latitude, to the west by Alaska, to the east by the Rocky Mountain Ranges and the 136th meridian, and to the north by the Arctic Ocean; and it has an area of about 192,000 square miles, of which over 150,000 are included in the watershed of the Yukon.

The main geographical results were: an instrumentally-measured line from the head of Lynn Canal to the intersection of the Yukon or Pelly by the 141st meridian; an instrumental survey of the Stikine from its mouth to the head of navigation (Telegraph Creek), connected with Dease Lake by a carefully paced traverse; a detailed running or track-survey following the lines of the Dease, Upper Liard and Pelly rivers and connecting with the line at the mouth of the Lewes.

The entire distance travelled during the exploration amounted to 1,322 miles, and this, taken in connection with the coast-line between the Stikine and Lynn Canal, circumscribes an area of about 63,200 square miles, the interior of which is still practically a *terra incognita*. The same description, says Dr. Dawson, with little qualification, applies to the whole surrounding region outside the surveyed circuit; so that there remain scope and verge enough for future explorers in the 192,000 square miles of the Yukon District. Along the routes travelled numerous points were carefully fixed in latitude by sextant observations, and a sufficient number of chronometer longitudes were obtained to lay the whole down within small limits of error. Special attention was paid to the fixing of mountain topography in sight from

the line of travel and approximate altitudes of more prominent peaks were ascertained.

Dr. Dawson was disappointed in the size of the Yukon River where he saw it below the confluence of the Lewes. At this point the Yukon (or Pelly, the name Dr. Dawson inclines to prefer) was about 1,700 feet in width, with a maximum depth of about ten feet, and there seems to be little doubt that its magnitude has been exaggerated in previous reports. Its total drainage area is but 331,000 square miles, less than half that of the Mackenzie, and there is nothing to show that there is any serious difference in the amount of precipitation over the two areas.

Lieut. Schwatka's dealings with the nomenclature of rivers and places in this region do not commend themselves to Dr. Dawson. He holds, fairly enough, that the old established and prior name of the Lewes River should not be arbitrarily erased in favor of the Yukon, and he declares that it is in any case incorrect to assert that the Yukon (Lewes) rises in Lake Lindeman, for the greater part of the water of the river enters by the Taku arm of Tagish Lake. Due credit is given to Lieut. Schwatka for having made the first (and reasonably accurate) survey of the river, and many of the names he invented are retained by Dr. Dawson, "more especially in view of their scientific eminence."

This seems to be a mistaken principle. It would be an act of presumption on the part of a tourist to bestow names on mountains and rivers at his own pleasure, and the license refused to him should be all the more sternly refused to an explorer who is under serious bonds to truth and to history and to the civilized world.

The report is illustrated by a map on a scale of 1 : 506,880, in three sheets.

WINTER NAVIGATION OF THE ST. LAWRENCE RIVER.— This subject, which has been taken up by the Quebec Geographical Society, is treated at considerable length in the *Transactions*, just issued, for the years 1886-87,-88-89.

Letters are printed from mariners and other persons of experience, all to the effect that the practical difficulties in the way of the desired end may be overcome. It is declared that the complete success of the ice-boats used in Sweden and Denmark for opening the Cattegat has solved the problem.

An extract from *Le Génie Civil*, of December, 1886, gives an account of the first experiments made at Gottenburg, where a channel was cut with ease through ice 13 inches thick. This triumph moved the people of Christiania, in *Sweden*, to follow the example, and this strange conduct does not seem to have surprised the Quebec geographers.

Capt. N. LeVasseur vigorously calls for action by the Dominion Government, and urges upon its attention two important considerations :

"1st. That many countries, in a position identical with our own as regards winter navigation, will profit by the experiments made in Canada ; 2d. That thousands upon thousands of the Canadian people, from one end of the Confederation to the other, will be greatly benefited, some directly and others indirectly, by the definitive solution of the problem."

Other papers in the *Transactions* are : The Landfall

of Cabot, by Mr. J. P. Howley, who does not take Prof. Horsford's view ; The Moundbuilders of North America ; Lake Mistassini ; The Copper River Indians ; Notes on Labrador, etc.

A tribute of respect is due to the energy and steadfastness with which the Quebec Geographical Society has borne up under the discouraging conditions of the past four years, and it is to be hoped that the future holds for it nothing but prosperity.

STORM SIGNALS AT HAVANA.—The U. S. Hydrographic Office publishes in the Pilot Chart of the North Atlantic for September the system of storm signals, which went into effect at Havana on the 2d August, and will be observed during the hurricane season (July—October) in the West Indies :

TRIANGULAR RED FLAG.—Cautionary signal.

SQUARE FLAG, YELLOW AND BLUE HORIZONTAL STRIPES.—Storm signal.

BLACK BALL.—The port is closed.

BLACK BALL OVER TRIANGULAR RED FLAG.—Indications of clearing weather.

BLACK BALL OVER YELLOW AND BLUE FLAG.—Clearing weather.

The signals are shown at the office of the Captain of the Port and at the Morro Semaphore Station.

THE MEXICAN FLOODS OF 1888.—The *Observatorio Meteor.-Magnético Central*, of Mexico, has issued a very full supplement to the December number of its *Boletín*. This supplement contains detailed reports of the disastrous floods in the month of June, 1888, the re-

sult of the excessive rains which began on the 6th and continued to the end of the month, over a surface "comprehended between the parallels of 16° and 50° N., and the meridians of 62° and 107° W. of Greenwich, embracing, therefore, in the United States the States on the Atlantic and the Gulf, and those adjacent and covering the Mexican Republic in a N. E.-S. W. direction to the S. of a line drawn from the extreme northwestern part of Tamaulipas to Mazatlan. In all this region it rained from the Gulf to the Pacific."

The destruction, great everywhere throughout this vast extent, was most marked in the city of Leon, in the State of Guanajuato. The population numbered 80,000, and out of the 249 blocks, or squares, of houses in the city, 117 were inundated and 79 were completely destroyed.

Two hundred and fifty-two dead bodies were recovered, but many were swept away by the waters.

The latter and larger part of the supplement is devoted to an account of the September cyclone of 1888, which wrought such havoc in Cuba and the north of Yucatan.

This interesting publication is illustrated by maps of the cities of Leon and Lagos, showing in colors the inundated portion of each, and by a third, representing the path of the hurricane across the island of Cuba.

DRAINAGE OF THE VALLEY OF MEXICO.—The *Railroad and Engineering Journal*, for September, gives a map and a brief description of the plan, now in process of execution, for relieving the city of Mexico from the dread of inundation. The city stands on the shore of

Lake Tezcoco, the lowest of the six lakes in the Valley, which has an area of about 1,650 square miles.

The canal, the principal feature of the plan, is divided into two parts, the first, 12.4 miles in length, to carry water from the lake to the city, and the second, nearly three times the capacity of the first, to carry the surplus water of the lake and the discharge from the city. This second section is 17.4 miles in length and 21 feet in depth; and the fall for the whole length is 1 : 5,000. The most important part of the work is the tunnel, which will begin at the end of the canal and extend through the mountains for a distance of 5.9 miles, with a deep cutting of 1,640 feet in length at the outer end. The fall through the tunnel will be 1 : 1,000 and the cross-section will be semi-ovoid.

The upper or arch part of the tunnel will be lined with brick, and the lower part with stone and cement; and much of the work which was done over twenty years ago can be utilized in the construction of the canal.

LABRE'S EXPLORATIONS IN BRAZIL AND BOLIVIA.—The August number of the Royal Geographical Society's *Proceedings* has an account, contributed by the Peruvian Vice-Consul at Southampton, of Col. Antonio R. P. Labre's journeys in the region comprised between the Beni and the Purus rivers. These journeys, performed at various times between the years 1872 and 1887, were undertaken mainly for the purpose of investigating the resources of the country and exploring commercial routes. In his earlier visits the traveller became familiar with the Ituxy River, a tributary of the Purus, navigable

during the wet season for 370 miles, and in 1884 he took two steamers up to the mouth of the Curykethé, 200 miles from the Purus. There he established india-rubber stations, which are visited every year. Up to this point the banks of the Ituxy are low and often flooded, but beyond it the ground is higher. The soil is good, and the river flows through a forest. There live in this district tribes of Indians, still in a wild state. Each tribe has numerous small villages governed by one or two chiefs. In 1879 three youths of the Hy-puriná tribe were entrusted to Col. Labre for education and one of them has learned how to read and write. The whole number of the natives living on the Purus and its tributaries is estimated at 40,000, speaking forty or more different languages.

The principal journey was the one made in 1887 for the purpose of crossing overland from the india-rubber settlements on the Madre de Dios, an affluent of the Beni from the west, to the nearest navigable point on the Aquiry tributary of the Purus, in order to ascertain if the ground offered facilities for the construction of a road. Col. Labre ascended the Madeira from the Amazon, with a well-equipped party of Bolivian traders, to San Antonio at the foot of the falls. From this place to Villa Bella, at the mouth of the Beni, is a distance of 161 miles. All the trade between the Amazon River and Bolivia passes this way. There are nine falls or rapids to be turned by unloading the canoes and dragging them overland on wooden rollers, and Col. Labre took 34 days to accomplish the journey. He ascended the Beni, which has low, forest-covered banks, with many islands in the stream, and inland lakes com-

municating with it from both sides, up to its junction with the Madre de Dios.

At Port Maravilha on this river he began his overland march. The country was covered with forest, part of it composed of Brazil-nut trees. The first village was inhabited by civilized Araúnas. Three days later the party came to a second settlement, where they passed the night; and two days after to a third, with about 200 inhabitants. These Araúnas had a form of government (which is not described), temples, and worship. The villagers had plantations.

Their women are not allowed to enter a temple nor to take part in the religious or fetich ceremonies, and they are forbidden to know the names or the forms of the idols. These idols are geometrical figures made of polished wood. The father of the gods is called Epy-mará; his figure is of elliptical form and about 16 inches high. There are also gods of stone. There are "medicine-men" charged with religious duties and living a celibate life, and the chief is the *pontifex*.

Another chief, at a place called Cuyneputhsúa, undertook to pass Col. Labre on to the Guarayos, a neighboring people. Up to this point the march had been in a northwesterly direction; but here it turned to the west, and led through a country like that already traversed, full of streams and dense forests. At the Caramánu River the Guarayo district was reached and the original northwesterly direction was resumed.

Beyond the Guarayo district was that of the Cannamary, who did not seem to be pleased at the sight of the white men; and Col. Labre thought it prudent to withdraw to the forest for the night.

The march was resumed the next day, but the people fled from the strangers. Another tribe, the Cannarana, acted in the same way, but there were no mishaps, and on the 30th August, 20 days after beginning his overland journey, Col. Labre arrived at Brejo da Ponte, on the Aquiry River. He reports that the route is practicable, and will become, especially if a railway is constructed, the highway for all the trade of the Mamoré and Beni basins.

LAKE TITICACA.—Dr. Alfred Hettner in his third Report on his travels in Peru and Bolivia (*Verhandlungen der Gesellschaft für Erdkunde*, Berlin, No. 6, 1889), notes the evidences of great changes in the level of Lake Titicaca, in the terraces which surround it. He believes that in a comparatively recent geological period the surface must have been about 65 feet higher than it is now, and that the lake extended over the greater part of the neighboring plains, perhaps even as far as the Poopo (or Aullagas) Lake. At an earlier date the level must have been, as numerous indications show, 660 feet higher than at present, but there are signs also that it must have been depressed at one time below the level of to-day. The highest mark of the lake-level is older than the evidences of glacial action in the region, and contemporaneous with a period of especially strong volcanic activity, and certainly of the later Tertiary; and the 65 feet terraces may belong to the glacial period.

Dr. Hettner could find not the least support for the theory that the lake was in ancient times covered by the sea; but he is not prepared, in the absence of acquaint-

tance with the southern portion of the highlands, to deny that a communication between the lake and the ocean may have existed in the time of the 660 feet terraces.

IMMIGRATION INTO THE ARGENTINE REPUBLIC.—The *Boletín*, Vol. 10, No. 5, of the *Instituto Geográfico Argentino* gives a table showing the movement of immigration into the Republic since 1857. The table is official, having been prepared by the Superintendent of the Department of Immigration, and its figures tell a plain story. The arrivals were :

In 1857	4,951	In 1873.....	76,332
1858.....	4,658	1874.....	68,277
1859.....	4,735	1875....	42,066
1860.....	5,656	1876.....	30,965
1861.....	6,301	1877.....	36,325
1862	6,716	1878.....	42,958
1863.....	10,408	1879.....	55,155
1864.....	11,682	1880.....	41,651
1865.....	11,767	1881.....	47,484
1866... ..	13,696	1882.....	51,503
1867.....	17,046	1883.....	63,243
1868.....	29,234	1884.....	77,805
1869... ..	37,934	1885.....	108,722
1870.....	39,967	1886.....	93,116
1871	20,933	1887.....	120,842
1872.....	37,037	1888... ..	155,632
		Total.	1,374,797

Of this number 990,192 came directly from beyond sea and 384,605 by way of Montevideo.

The figures do not include the 250,000 first-class passengers who entered the country during the thirty-two years; so that the whole immigration for the period amounted to 1,624,797.

According to the U. S. Census the arrivals of for-

eigners in the United States for the period 1790-1840-41 were 1,132,860. The next ten years added to this number 1,593,826.

Of the 990,192 immigrants from beyond sea into the Argentine Republic there were 646,086 Italians, 144,654 Spaniards, 91,759 Frenchmen, 22,952 Englishmen, 18,072 Swiss, 16,768 Austrians, 15,271 Germans, 7,645 Belgians, and 26,985 of various nationalities, not specified.

Three-fourths of the immigrants were men, the proportion of women varying from 29.5 per cent. of the Italians to 9.2 per cent. of the Belgians.

THE MANCHESTER GEOGRAPHICAL SOCIETY. — The *Journal* of the Manchester Geographical Society, hitherto published at irregular intervals, will be issued quarterly during the present year, and will so continue. It is a pleasure to note this evidence of prosperity in a society whose four years of existence have been full of good work.

GEOGRAPHY AT OXFORD. — Mr. H. J. Mackinder, M. A., Reader in Geography at Oxford, reports to the Royal Geographical Society (*Proceedings*, August, 1889) that the past Academical year has been one of steady progress. His audiences were twice as large as those of the previous year, and his subjects were :

The Physical Geography of the Continents, the British Isles, The History of Discovery, Western and Central Europe, The Mediterranean and Mediterranean Lands, and Russia and Asia with reference to History.

Prof. Freeman, Mr. Sidney Owen and Mr. George also lectured on geographical subjects.

Mr. Mackinder finds that the number of his hearers will vary from 5 to 80, and that if the Readership in Geography is to have an established position, it must be through the History School.

There is now, it seems, no separate paper on Geography set in the examination. Compulsory Geography questions are now set in the History papers and Mr. Mackinder was requested, but refused, to lecture on the geography of special periods. This he felt would make his teaching merely historical, and all that remained was to offer to historical students an elementary course which should present a general but vivid conception of the theatre of history. He is led to hope for a large class next year.

There is a tone of disappointment in Mr. Mackinder's letter, and his admissions do not sustain the promise of his opening sentence; but there is no reason why he should be discouraged.

It would be an excellent thing if geography could be studied for itself, but it has practical relations with history, and these have long constituted its chief value in the eyes of the educated public. To purge the general sight is a work of time, and the public must do its part. A great deal has been gained when 5 men, or 80 men, have been induced to study geography with or without history.

METEOROLOGY AND CLIMATE OF SUEZ.—Mr. W. G. Black, Surgeon-Major, Edinburgh, contributes to the *Journal* of the Manchester Geographical Society, Nos.

7-12, 1888, a paper on the climatic conditions at Suez before and after the opening of the Canal.

The prevailing winds are north and northwest. The hot winds are the *Khamseens*, mostly from the south but frequently from the west. They last two days, very rarely to the third day, and are followed by the etesian wind from the north. This is very violent and fills the air with fine sand so that the sky takes a yellow color.

The observations for 1866-1869 were made by Mons. Brittain; those for 1869-1872 by Dr. J. A. Woolfreys.

The monthly tables show that the average maximum of summer temperature has risen from 102.7° to 111.5° and the average minimum has fallen from 64.7° to 60.7° , while the winter temperature has advanced from 75.4° to 86.2° , maximum, and has fallen from 46.4° to 39.8° , minimum.

These changes may be partly due to the movement of water into the Canal from the heated Red Sea on the one side and from the colder Mediterranean on the other.

The summer heat at Suez often rises to 100° - 120° , but the mercury sometimes falls to 44° - 32° ; and in winter the range is from 30° or 40° to 80° or 90° .

The barometer in the winter months is high, but the whole range from the lowest in spring (29.59 in.) to the highest in winter (30.49 in.) is small.

WHAT IS DONE IN ZULULAND.—*L'Afrique Explorée et Civilisée*, in the number for September, 1889 (pp. 261-262), quotes from a letter addressed to it by Mr. Charles Hancock, of London, one of the Executive Committee of the Aborigines Protection Society, two

statements concerning the treatment of the Zulus by the English. In one instance, cited by Mr. Bradlaugh in the House of Commons, a native was flogged with a cat-o'-nine-tails with points of iron. In the other, according to testimony before the Court at Etshowé (Ekhowa) in the trial of Dinizulu, Cetewayo's son, and other chiefs for high treason and rebellion, it was affirmed that three hundred women and children, captured by a detachment under the orders of Maj. McKean, were handed over to Uzibepu, a favorite of the Governor's, and to his soldiers, and were only released through the exertions of Miss Colenso and her friends.

The editor of the Geneva journal asks whether it ought to be possible to commit a deed so monstrous under the name of a nation that stands in the first rank of civilization. He may be astonished to learn that a similar atrocity stands on record against the name of no less a man than Gen. Gordon. In a book published in 1881, called "*Colonel Gordon in Central Africa, 1874-1879. . . . From Original Letters and Documents,*" edited by Dr. George Birkbeck Hill, and by him dedicated to Miss Gordon, there is (p. 345) a letter dated Edowa, March 31, and in this are the following passages: "This evening a party of seven slave-dealers with twenty-three slaves were captured and brought to me together with two camels. . . . I got the slave-dealers chained at once, and then decided about the slaves. The men and boys were put in the ranks; the women were told off to be wives (!) of the soldiers."

The "(!)" is in the printed text, and possibly represents Dr. Birkbeck Hill's amazement at the hero's decision. A few lines below is another passage: "When

I had just begun this letter another caravan, with two slave-dealers and seventeen slaves, was brought in, and I hear others are on the way. Some of the poor women were quite nude. I have disposed of them in the same way, for what else can I do?"

Contact with the less developed races undoubtedly tends to the blunting of the moral sense in civilized men, but this fact offers no excuse for Gordon. He refused, though urged, he says, "by a *Reverend*," to shoot the slave-dealers taken red-handed in these two instances, because there was no law to justify the act. He is regarded as a man of the highest type, and some writers, more familiar with names than with facts, have not been ashamed to speak of him as a Sidney or a Bayard.

Nevertheless, there are thousands of Englishmen in command, comparatively unknown men, who would die rather than be guilty of the brutality that Gordon confesses without a sign of remorse. It is by men of this stamp, in every nation, that the real work of civilization is to be done in Africa.

THE MAP OF THE TRANSVAAL.—Mr. Fredk. Jeppe, F. R. G. S., has lately brought out a map in four sheets on a scale of 15.78 miles to the inch, showing the South African Republic and the adjacent territories. The map is based on a number of authorities, official and other, and is a most creditable piece of work in style and appearance; but it has called forth a solemn protest from the Lisbon Geographical Society in a letter dated 31st July, 1889.

According to this letter the western boundary of the

Portuguese province of Mozambique is arbitrarily pushed at least half a degree too far to the east; and this assertion is rather supported than contradicted by the legend inscribed on the boundary line: "Approximate Western Limit of Portuguese Possessions." In such cases the approximation is never made at the expense of the greater Power, actually or prospectively in possession, and the protest of the Lisbon Society ought to be recorded.

THE ERUPTION OF BANDAI-SAN.—*The Journal of the College of Science, Imperial University, Japan*, Vol. III., Part II., is wholly devoted to an account of the Bandai-san eruption of July 15, 1888, by Profs. S. Sekiya and Y. Kikuchi.

Bandai-san (Lat. $37^{\circ} 36' N.$, Long. $140^{\circ} 6' E.$) is one of a number of volcanoes, active and extinct, in the province of Iwashiro. The district about the mountain is made up of tufaceous deposits and sheets of volcanic rock. On the south side of Bandai at an elevation of 1,600 ft. above the sea is the lake Inawashiro, one of the largest in Japan, not a crater lake, but fed, before the eruption, by the river Nagase. The upper course of this river was stopped by the masses thrown out by the volcano, and the lake is now supplied by a tributary stream, the Sukawa.

On the morning of July 15, 1888, the weather was fine, with a gentle breeze. Soon after 7 o'clock, curious rumblings were heard, followed by an earthquake which lasted more than twenty seconds, and at 7.45 the eruption took place. There were fifteen or twenty explosions, accompanied by dense columns of dust and steam.

At the foot of the mountain there was a rain of hot, scalding ashes, with a pitchy darkness. A little later, the darkness continuing, a smart shower of warm rain fell for about five minutes; and then a mighty avalanche of earth and rock rushed at terrific speed down the mountain, buried the Nagase valley and its people and devastated an extent of 27 square miles.

The destructive agency was merely the sudden expansion of imprisoned steam, unaccompanied by lava flows or pumice. The eruption may be compared to the firing of a tremendous gun, such an one as can only be forged by Nature.

Terrible wind blasts swept every growing thing before them. In one field of rice on the southeast of the volcano "the slender stalks were laid flat upon the ground as evenly and regularly as if they had been combed down in parallel lines. Not a stalk lay across its neighbours. The heads of rice in one furrow covered the roots in the next furrow."

After the eruption immense numbers of holes of various sizes were remarked on the mountain slopes, and the origin of these holes has been a matter of discussion among the scientists. Prof. J. Milne believes that they were caused by the earthquake shocks; but Messrs. Sekiya and Kikuchi refer them to the falling stones and fragments of rock. A number of the holes were dug open and at the bottom of each was found a mass of rock or a stone. This should seem to be decisive, though merely circumstantial, evidence.

The form of the crater is now that of a horse-shoe, open towards the north. From east to west it measures 8,080 ft., and from north to south 7,460. The original

height of the mountain (Kobandai, or Little Bandai) is not accurately known, but it is believed to have been about 6,037 ft. The crater-bed is 3,839 ft. above the sea, and the undestroyed southwestern part of the mountain rises 1,658 ft. above the crater. The portion that was blown away must therefore have had an altitude of 2,198 ft. above the crater. With this went also 540 ft. from the top of the southwestern wall that remains.

Ten full-page plates illustrate the *Journal*.

THE FOREIGN TRADE OF CHINA.—The *Returns of Trade and Trade Reports for the Year 1888*, published by order of the Inspector-General of Customs, show a stationary condition for the years 1876–1886, followed by a marked increase both in export and import values for 1887 and 1888. For the eleven years first named the average total was 150,131,120 *Haikwan* Taels (1 Hk. Tl. = \$1.15). For 1887 the amount was 188,123,877, and for 1888 217,183,960 Hk. Tls. The Customs Revenue rose likewise from an average of 13,607,271 Hk. Tls. for the eleven years to 20,541,399 for 1887, and 23,167,892 for 1888.

EXPLORATION OF THE OWEN STANLEY RANGE.—The *Scottish Geographical Magazine* for August publishes a telegram received by the Colonial Office from the Governor of Queensland, in these words: "MacGregor returned Port Moresby after most successful exploration crest Owen Stanley Range; named Mount Victoria, 13,121 ft.; new mountain north of Owen Stanley, 12,500, named Albert Edward; many other peaks of little lower elevation discovered and named."

Details of this achievement, promised by the Colonial Office, have not yet been received.

Mt. Owen Stanley is supposed to be the loftiest mountain of the Pacific, S. of the Equator, with the possible exception of Kinabalu, in Borneo.

Previous attempts at climbing Owen Stanley, though made by competent explorers, resulted in failure.

Sir William MacGregor was probably better supported and supplied than his predecessors.

TAPPENBECK AND DOULS.—These two courageous explorers have fallen almost simultaneously in Africa, while their work was hardly begun.

Lieut. Tappenbeck and his associate, Lieut. Kund, in their march overland through the Congo Valley, ran great risks from the hostility of the natives, but made their way safely, with mingled tact and firmness, to the Ikatta River. The story of their adventures is full of interest and excitement. They afterwards went to the Kamerun Colony and it was there that Lieut. Tappenbeck sickened with the fever, and died, late in July.

Camille Douls, who has perished by assassination in the Western Sahara, was but twenty-five years of age. He began his career as an explorer four years ago by landing on the coast of the Sahara in the guise of a Mussulman, and travelling in that character through the western part of the desert. His extraordinary command of Arabic saved him on more than one occasion, but there is little reason to doubt that he had in some way roused the suspicion of his fanatical guides in his attempt to reach Timbaktu. His last letter, written

from Tangier before starting, showed that he knew the dangers that lay before him.

Rapport présenté au Ministère de l'Agriculture, du Commerce et des Travaux Publics et à la Société de Géographie de Rio de Janeiro sur le Déplacement et le Transport du Météorite de Bendegó, de l'Intérieur de la Province de Bahia au Musée National par José Carlos de Carvalho Ancien-Officier de la Marine de Guerre Nationale. Rio de Janeiro, 1888. (from the Author.)

The meteorite of Bendegó was found in 1784, in the neighborhood of the little stream from which it takes its name. (Bendegó is the Portuguese form.)

An attempt was made the following year to remove the mass, but the cart on which it had been placed broke down and the stone was deposited in the stream. There it remained for a number of years, till it was visited in 1810 by a man of science, A. F. Mornay, who found on examination that it was composed of iron. He broke off with great difficulty a piece of several pounds' weight and sent it with a letter to Dr. Wollaston, who read the letter before the Royal Society in 1816, with a note of his own, giving an analysis of the fragment. It was found to be composed of: Iron 95.1 per cent.; Nickel 3.9 per cent.; and 1 per cent. of other substances.

Mornay gave the following measurements of the mass: Length, 7 ft.; width, 4 ft.; thickness, 2 ft. He estimated the contents at 28 cubic feet, and the weight at 14,000 pounds.

In 1887 the Geographical Society of Rio de Janeiro undertook to transport the meteorite to the National

Museum. The difficulties of the task were considerable. The unwieldy mass was to be carried a distance of 70 miles, over long slopes of 18 to 20 degrees and down inclines of 30 degrees in the Serra d'Acaru, and across a number of streams, some with very steep banks, to the railway station at Jacuricy. An iron waggon, of about a ton's weight, was built for the occasion, and the work was successfully accomplished, after many interruptions caused by bad weather and the breaking down of the waggon, in 126 days.

The Report, which is a large quarto in French and Portuguese, is illustrated by a photograph of the meteorite and a folding plan of the route travelled.

Esboço Geographico da Provincia do Paraná, por Sebastião Paraná, Rio de Janeiro, 1889. (from the Author.)

The province of Paraná is in southern Brazil, between São Paulo on the north and Santa Catharina on the south. It covers about 170,000 square miles and its limits are well defined by rivers on the north, west and south, and by the ocean on the southeast.

It is one of the four provinces towards which European immigration is most strongly attracted by the fertility of the soil and the salubrity of the climate.

Mr. Sebastião Paraná gives in his little book a brief and well-arranged description of the country, its mountains and rivers, its climate, vegetable and mineral products, and an account of its cities and towns.

The soil produces sugar, cotton, tobacco, coffee, rice, tea, and in the highlands wheat and other grains. The tea culture is so general that many families raise the

leaf for their own use, and the Government has had it in view to extend the culture by establishing a colony of Chinese ; but Mr. Paraná rather approves the policy of the United States, "the model country on the question of immigration," in rejecting the Asiatics. He thinks at the same time that perhaps the Chinese might be accepted in Brazil "as a simple automaton for the work which is peculiar to him." A closer acquaintance with the automaton may show that he is not so simple as he looks.

Mr. Paraná's *Esboço* is his first essay in geographical work, and it is creditable to him.

Travels in the Atlas and Southern Morocco. A Narrative of Exploration. By Joseph Thomson, F. R. G. S. New York, 1889.

Mr. Thomson says in his preface that he has only recorded "something of what we saw and experienced in the parts in which we travelled."

This frank confession disarms criticism, though the reader may fairly enough object to the size of the book and the iteration of some experiences.

There is a little too much of Shalum the Jew, and the long palavers with the men in power are common incidents of travel in Mohammedan countries.

The suspicious fanaticism of the people defeated more than one of Mr. Thomson's purposes. He was able to penetrate but a little way into the Atlas Mountains, and the altitudes of peaks visited or seen are estimated rather than measured.

He gives to the Tizi-Likumpt, which he climbed, a height of 13,150 feet, and to the Tizi-n-Tamjurt, which

he takes to be the loftiest point of the Atlas, an elevation of not less than 15,000 feet.

It was in the central Atlas, on the Wad Agandice, that he discovered the most magnificent gorge he had ever seen, "such as may be found in America;" or, if Mr. Thomson would go there, at Les Causses, in France. "Imagine," he says, "a great yawning crack running right across a range of mountains. Picture yourselves at the bottom. On either side you look skyward over 5,000 feet of beetling cliffs and precipices, broken into by areas of extremely steep slopes and deep-cut crevices, and capped by fantastic rocky peaks and turret-like masses."

The city of Morocco disappointed the traveller. It covers a quadrangular space of about eight miles on a side, and the general dead level of the reddish, flat-roofed houses is broken only by the square minarets of the mosques, ten in number, which rise to the height of from 60 to 100 feet. Of these minarets one, the Kutubia, built of stone and 270 feet high, dominates the city and the plain around it for thirty miles, and is the most striking monument in all Southern Morocco, resembling and not unworthy to be compared with the Giralda of Seville.

The Moors were found to be dignified and courteous, though fanatical, cleanly in their habits, but false-hearted and morally corrupt beyond all other men; a sad distinction conferred upon them possibly by Mr. Thomson's perfervid genius, or his haste.

In the mountains and south of the Atlas the Jews are greatly oppressed, but in the towns and in Morocco proper they are the oppressors. They are largely gov-

erned by their own laws, administered by their own Sheiks, and with their own code of punishment. They are not liable to conscription, nor are they taxed for the support of the Kaid and the Sultan; and their lives and property are comparatively safe. As money-lenders they divide with the Government, which plunders the people, the whole wealth of the country; and when they suffer an injustice their cause is taken up by the representatives of the European Powers. Their way of life and their streets in the *Mellah*, or Jewish quarter, are foul in the superlative degree.

Excepting the Englishmen, whose hands are clean, the foreign agents in Morocco, says Mr. Thomson, drag the honor of the various nations in the mud by their traffic in the sale of "protections." Of all the sinners the Americans are the most shameless. They have no trade, no genuine subjects, no real or imaginary interest to look after, yet there is an American Minister at Tangier, besides Vice-Consuls, mostly Jews, in the chief coast towns. "Nay, more;" he adds, "America does not hesitate to make a naval demonstration to compel the payment of bills run up in the Jewish fashion—a few paltry hundreds of dollars becoming in a year or two thousands upon thousands."

The American Minister at Tangier is a consul, and it may be true that he and the vice-consuls (if these exist) are something of a luxury. Nations, like peacocks, love to display themselves more or less shamelessly, but it is yet a comfort to know that virtue will not die out of the world so long as the English survive.

Even they, however, may be tempted too far, and it

would be cause for lasting and vain regret if the example of the American demonstration against Morocco led England, hitherto without reproach in such matters, to enforce at the cannon's mouth the payment of disreputable claims.

The book has many excellent illustrations, fine maps and a plan of the city of Morocco.

The History of a Slave. By H. H. Johnston, F. R. G. S., F. Z. S. London, 1889.

In this book Mr. Johnston attempts "to give a realistic sketch of life in the Western Sudan." He has endeavored, he says, to make his landscapes, architecture, implements, costumes, and studies of human types, as locally accurate as possible.

None but those who are acquainted with the Sudan can say how far this endeavor has been successful, but it is not too much to affirm that the book, or booklet, as Mr. Johnston calls it without a shudder, is a masterpiece. The story is told without effort and without exaggeration, and for naturalness Abu-l-Guwah belongs to the family of Robinson Crusoe.

The First Ascent of the Kasai: Being Some Records of Service Under the Lone Star. By Charles Somerville Latrobe Bateman, with Illustrations and Maps. New York, 1889.

Mr. Bateman was second in command of the expedition which escorted Calemba, the King of the Baluba, back to his native country. Calemba had descended the Kasai with Lieut. Wissmann, to see the Congo and the European establishments.

The author does not claim to have written a book of discovery.

He has wished to give a representation of places and things, climate, scenery and people ; and he has been careful to describe not merely the outward appearance of things, but the impression produced upon himself by the circumstances which occurred and the scenery through which he passed. He has endeavored to expose the covert slave-trade carried on by the Angolese subjects of Portugal, and this is well ; but is there no slave trade open, or covert, in other European colonies, or African States controlled by Europeans ? Mr. Bateman does not reason very soundly on the slavery question. He says : " It is but right that I should draw attention to the difference existing between slave-owning and slave-dealing. So far as I can see, slavery must exist in the regions watered by the Congo and its tributaries for a very long period to come : its suppression, were it possible, would lead to anarchy and misery without conceivable limits. But slave-dealing is quite another matter." . . .

If this means anything, it means that you may have slaves, but you must not buy them. There are, perhaps, but three other ways of acquiring this desirable property ; a man may inherit slaves, or he may raise slaves, or he may go out and hunt them. These, then, are laudable methods, but to buy the property is sinful, because there must be a dealer to sell it.

Mr. Bateman saw nothing that interested him or struck him as being specially hopeful in the composition or conduct of the Baptist and other Reformed Missions in the State.

This negative condemnation is itself reduced to nothing by the mention of one Baptist missionary who was devoted to his work to the point of helping Mr. Bateman through an illness.

The natives were generally friendly and the voyagers stopped long enough at various points to devote some study to the tribes and their ways of life. Among the many illustrations from Mr. Bateman's drawings there are types of the Basongo-Meno, the Bakété, the Zingas and others, with representations of their weapons and implements; and among the portraits is one of Senhora Caxavalla, a genuine African beauty. Fine colored views give a lively idea of the scenery.

A permanent record of the trip was made by the establishment of the Luebo Station at the confluence of the Luebo and Lulua rivers.

The Geography of the Sea. By Lieut. George L. Dyer, U. S. N. In Charge U. S. Hydrographic Office, Navy Department. (from the Author.)

Lieut. Dyer, as one of the Vice-Presidents of the National Geographic Society, of Washington, is charged with the duty of making an Annual Report on matters that fairly come under the head of the "Geography of the Sea," according to the classification adopted by the Society. The present pamphlet is his first Report, and he has thought it advisable to give a "brief outline of the progress made in our knowledge of the sea since 1749, when Ellis reported depths of 650 and 891 fathoms off the northwest coast of Africa." In fact it was impossible for Lieut. Dyer, considering the restricted space at his command, to do more than hint at the

results accomplished in oceanography by the untiring industry of the scientific men of every nation. It is a service done to call public attention to these results, and the somewhat extended notice of the work done by the U. S. Coast and Geodetic Survey Steamer *Blake* will undoubtedly attract many, for whom the sea as the common highway of mankind has but little interest.

What is known as to the temperature, the chemical composition, and the relative depths of the ocean is set forth in three or four pages.

Le Projezioni Cordiformi Nella Cartografia per M. Fiorini. Roma, 1889. (from the Author.)

This pamphlet, reprinted from the *Bollettino* of the Italian Geographical Society for July, 1889, is intended as a supplement to previous writings of Prof. Fiorini's on the subject of the cordiform, or heart-shaped projections, so much in favor with the cartographers of the XVIth Century. The invention or, at least, the suggestion of this form is ascribed by the writer to Bernardus Sylvanus, of Eboli, from whose maps the idea was taken and improved by Werner, who was followed by others, as Orontius Finæus, Vadianus and Mercator. The last brought out in 1538 his double-heart-shaped map of the world, the *Orbis Imago*, of which the only known copy is now in the library of the American Geographical Society. Prof. Fiorini gives the history of this unique map, discovered by the late James Carson Brevoort in a copy of the *Tabulæ Geographicae Cl. Ptolemaei*, published by Mercator in 1578. Reproductions of the *Orbis Imago*, with modifications of the inscriptions and the omission of the dedication, were published

at Rome, by Lafreri and by Salamanca, "two real plagiarists," says Prof. Fiorini, who simply appropriated the work of Mercator.

The most remarkable of all the cordiform maps still in existence, is the Turkish Mappamundi, described by D'Avezac. This is engraved on six (not four) wooden tablets, found in 1795, in the Archives of the Council of Ten, at Venice, and now preserved in the Library of St. Mark. When discovered, the tablets were in good condition, and twenty-four copies of the map were worked off from them; but they are now past service. The date of the work is 966-967 of the Hegira (1558-1560, A.D.).

The maker of the map was Hadji Ahmed, a native of Tunis, who studied mathematics at Fez, then a centre of Mohammedan learning. He was captured by the Christians and sold to a gentleman, who allowed him to pursue his studies.

His work is evidently modelled on that of Finæus, but it is no servile imitation. Hadji Ahmed rearranged the intervals of the parallels and the meridians, and introduced, as Prof. Fiorini points out, a number of improvements. He added many names, and corrected the outlines of the coasts of the New World, on both oceans; and he represented the northern regions with a nearer approach to exactness than Finæus.

There are four copies of the Turkish map: one in the Library of St. Mark, another in the Seminario of Sta. Maria della Salute, a third in Prince Metternich's library at Vienna, and the fourth in the Correr Museum, at Venice. This last was brought to light during the present year in a volume, containing a number of miscellaneous wood engravings.

The Library of St. Mark possessed, up to the year 1865, a second copy of this precious work, bound in a volume for the use of students ; but it has disappeared.

The copy just found in the Correr Museum is certainly not the lost one, for the volume of engravings was bound by Lazzari, who died in 1864.

The cordiform projection did not stand the test of time. The first Mappamundi in this style was published in 1531, the last in 1566. According to Prof. Fiorini cartographers were led to abandon this shape on account of the great linear and angular alterations unavoidable in it.

Note.—In an appendix, on p. 676 of the *Bollettino* for August, received just before going to press, Prof. Fiorini reports the discovery of the missing Turkish map at the Library of St. Mark. Cav. Castellani, the librarian, writes on the 10th of August :

"After the receipt of your last letter we continued the search for the second copy of the Turkish map ; and yesterday it was found in a bookcase under the systematic catalogue, where it must have been put by my predecessor. . . . With the map was Assemani's *Dichiarazione*."

There are, therefore, five copies of the map in existence.

Annuario dell' Istituto Cartografico Italiano, fondato il 1 Gennaio, 1884. Anno Terzo e Quarto. Roma, 1889. (from the Institute.)

The Italian Cartographical Institute is a private enterprise, supported by its own efforts and well supported, if the work of less than five years is judged on its merits. In that time it has published an original map of Assab and the neighboring country, a map of the Egyptian Sudan with the Red Sea Coasts as far as Assab, a map of the Alps near Susa, a map of the Italian possessions and protectorates, a map of the Italian railways, and an Elementary Atlas, besides the *Annuario*, which contains original articles on geograph-

ical subjects. The contents of the present very handsome volume are: Introduction, by G. Dalla Vedova; Cartographic Curiosities, by M. Fiorini; The Question of the Name of America, by F. Porena; The Difficulty of Determining Exactly a Difference of Longitude in Close Proximity to the Poles, by E. Millosevich; A Method of Giving Greater Exactitude to Measurements of Distances on Topographical Maps, by G. Govi; The History of Geography in Italy, With Particular Reference to the Catholic Missions and the Institute of "Propaganda Fide," by G. Pennesi; Brief Notes on the Geographical Institute of Justus Perthes, at Gotha, by G. E. Fritzsche; New Orometrical Formulas for Determining the Mean Elevation of a Crest and its Mass, by G. Ricchieri; Work of the Italian Cartographical Institute in Recent Years, by G. E. Fritzsche. The last two papers are illustrated by folding maps.

La Letteratura degl' Indigeni Americani, per Ferdinando Borsari, Napoli, 1888. Una Pagina di Storia Argentina per F. Borsari, Napoli, 1888. (from the Author.)

The first of these two publications is a lucid sketch of what is known concerning the native American literature, which Prof. Borsari takes to be worthy of serious attention on account of its human interest. His essay is marked throughout by a soberness of tone and a critical good sense, too often wanting in the notices of American literature, as in those of American archæology. He closes with a suggestion for the formation of an Italian Society of Americanists, and it cannot be

doubted that the scholars of the Peninsula will act on the suggestion.

The second publication gives in a few pages the story of the conquest of the Pampa, from the day in 1855 when Col. Bartolomé Mitre (inspired, possibly, by the example of Sir Charles Napier, setting out the year before to take Cronstadt "with sharpened cutlasses"), declared that he would protect the tail of the last cow in the province, to the scientific and vigorous campaigns of Gen. Julio A. Roca, who put an end to the Indian question in the Argentine Republic. This page of history teaching by example has its special application to the problem now before Italy in Abyssinia, and Prof. Borsari has evidently not looked beyond this; but Americans, remembering their own half-hearted and spasmodic dealings with the Indians of the United States, may see themselves as others see them in one sentence that describes the Argentine policy before the coming of Gen. Roca: "One day military expeditions were sent against the Indians, and the next money and gifts of every kind were lavished upon them to buy their good behaviour."

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

AMSTERDAM.—*Kon. Nederlandsch Aardrijkskundig Genootschap, Tijdschrift.*

Advance in the knowledge of the Globe during 1888—Fifty-eighth Meeting of the Kon. Ned. Aardrijkskundig Genootschap—Junction of the Amu-Daria with the Caspian Sea—Letter of Prof. A. Wichman to the Council—Eruption of Tandikat, Sumatra.

BERLIN.—*Gesellschaft für Erdkunde, Verhandlungen.*

A Monument to Adolph Schlagintweit—Description of Assam and Upper Assam—Stanley's Emin Pasha Expedition—Schweinfurth's Letter to Ascherson on Southern Arabia—Dr. Boas's Journey in British Columbia—Third Report of Dr. Hettner on his Travels in Peru and Bolivia.

Zeitschrift.

Suggestions for a Travelling Equipment for Eastern and Central Africa—Remarks on Wertheman's Map of a Portion of the Amazonas Province (Peru)—Diary in Banda, Timor and Flores—The Central Plateau of France—Astronomico-geographical Determinations of Places and Magnetic Observations in Kaiser Wilhelm's Land and the Bismarck Archipelago—Map of Flegel's Route—Explanations for the Map of the Kaiserin Augusta River.

Deutsche Kolonialzeitung.

Prince Bismarck and the German Colonial Policy—Dar-es-Salaam—Farini and the Kalahari Desert—The Germans in California—The German Colonial Development—Report of the Imperial Commissioner Wissmann on the Storming of Bushiri's Camp—Colonial Agitation—The Anti-Slavery Congress—The German Emin Pasha Expedition—The Yerba Maté—The English Government and the English—The Problem of the Germans in Latin and Anglo-Saxon America—The Trial of Dinizulu.

BRUSSELS.—*Société Royale Belge de Géographie, Bulletin.*

The Congo Railway—African Gum Copal—The Influence of Geographical and Social Characteristics in the United States.

Le Mouvement Géographique.

The Congo Railway—The Volta Basin—The International Control (of the Congo State)—Congo Commercial and Industrial Company—Exploration of the Lomami—Exploration of the Lulonga—The French Traveller Trivier on the Upper Congo—Lieut. Dhanis on the Upper Congo—The Congo Red Cross Society—Matadi as a Seaport—Explorations by the Steamer *Roi des Belges* in Tippu-Tip's Country.

BUENOS AIRES.—*Sociedad Geográfica Argentina, Revista.*

Pronunciation and Spelling of Geographical Names—Products of the Province of Buenos Aires—In Lapland.

Instituto Geográfico Argentino, Boletín.

Tenth Anniversary of the Institute—President's Address.

CAIRO.—*Société Khédiviale de Géographie, Bulletin.*

Travels in the Southern Galla Country and the Land of Sydama.

EDINBURGH.—*The Scottish Geographical Magazine.*

The Cocos-Keeling Islands—South-American Rainfall South of the Tropics—Scientific Earth Knowledge as an Aid to Commerce—Tridacna Pearls—A Note on Some Astronomical Observations taken upon a Journey from Quillimane to the North Extremity of Lake Nyassa—The Geography of the Caucasus—The

Province of Elizavetopol—Great Britain and Portugal in East Africa—Journey across the Inland Ice of Greenland from East to West—On Marine Deposits in the Indian, Southern and Antarctic Oceans—The Zambezi Delta—On The Achievements of Scotsmen during the Nineteenth Century in the Fields of Geographical Exploration and Research.

FLORENCE.—*Sezione Fiorentina della Società Africana d'Italia, Bullettino.*

The Mahdi—Statistical Notes on the Italian Possessions on the Red Sea—Our Native Soldiers at Massowah—The Sultanate of Opia (on the Eastern Coast of Somaliland)—Italy in Northern Africa—The Transvaal—Stanley's Expedition—Human Sacrifices at Funeral Rites and Cannibalism on the Congo.

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Across the Inland Ice of Greenland from East to West—The Local Distribution of the Tribes
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Islands—Expedition to the Cockscorn Mountains, British Honduras—The Geographical
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—The Influence of Snow on the Soil and

Atmosphere—Recent Researches into the Origin and Age of the Highlands of Scotland and the West of Ireland—The Floating Island in Derwentwater (found to be a peaty mass)—The Forest Flora of New Zealand—British Rainfall, 1888—St. Elmo's Fire on Ben Nevis.

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The Province of Santa Fé (Argentine Republic)—Italian Travellers—Buddha and His Doctrine—Relations of Italy with Abyssinia—The Rearing of Ostriches—Trees that produce India

rubber and Gutta Percha—Somaliland—The Southern Ports of Russia.

PARIS.—*Société de Géographie, Compte Rendu.*

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Atuatanas, or the Natives of Copper River—Belle Isle—(The following in French): Notes on Canadian Labrador—Notes to aid in the Development of Colonization and Commerce on the Banks of the St. Lawrence to the Frontier of Maine—The Primitive Races of North America—Winter Navigation of the Saint Lawrence—Distances from the Principal Sea-ports of North America to Galway, Liverpool, Havre, Havana and Rio de Janeiro.

RIO DE JANEIRO.—*Sociedade de Geographia, Revista.*

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The First Journey of a European from Assab to Shoa—The Present Reconstruction of Rome with Relation to its Past Transformations—An Excursion Across the Libyan Desert—Biographical Notice of Cristoforo Negri (on occasion of his 80th birthday, June 13)—Cordiform Projections in Cartography—The Gold Fields of South Africa.

VIENNA.—*Kais. Königl. Geographischen Gesellschaft, Mittheilungen der.*

The Development and Topography of the Rosetta Mouths of the Nile—Report on the Teleki Expedition to Central Africa—The President's Report for the Year 1888—The Work of the

Austrian State Institutions—The Mountain System of the Balkan Peninsula—Hydrography of the Samburu Lake Region—Hypsometry of the Southern Tyrolese Highlands and the Venetian Alps—Briccius : an Historical Fresco from the Goldtauern—The Trias of the School-maps of Lower Austria—The Middle Congo.

Deutsche Rundschau für Geographie und Statistik.

The Eighth German Geographical Congress—Travels in the Crimea—Vegetable Diet among Peoples of the North—Progress of Geographical Exploration and Travel in 1888—Norfolk Island—Physical Science as a Basis for Economical Geography—The United States of Venezuela—The Seismic Problem—The European Movement against the Slave Trade—The Valley of the Middle Waag (tributary of the Danube)—The Chiem See (in Bavaria) and its Swamps and Moors.

WASHINGTON.—*The National Geographic Magazine.*

Annual Address of the President : Africa, Its Past and Future—Reports of the Vice-Presidents : Geography of the Land, Geography of the Sea, Geography of the Air, Geography of Life.

WASHINGTON LETTER.

WASHINGTON, September 15, 1889.

The office of Superintendent of the United States Coast and Geodetic Survey, has been held for seventy-three years by men of great eminence. Here is the record :

Ferdinand Rudolph Hassler, 1816-1843.

Alexander Dallas Bache, 1843-1867.

Benjamin Peirce, 1867-1874.

Carlisle Pollok Patterson, 1874-1881.

Julius Erasmus Hilgard, 1881-1885.

Frank M. Thorn, 1885-1889.

Thomas Corwin Mendenhall, 1889.

It is one of the most distinguished scientific appointments in the country, and the recent selection of Prof. Mendenhall is considered an eminently proper one.

Born in Ohio, in 1841, Mr. Mendenhall was elected in 1873 professor of physics and mechanics in the Ohio State University. In 1878 he accepted the professorship of physics in the University of Japan, but resumed his chair in the Ohio State University in 1881, and in the following year organized the Ohio State Weather Service of which he was Director until 1884. In that year he was appointed professor in the United States Signal Service at Washington, where he remained until 1886, when he accepted the presidency of the Rose

Polytechnic Institute at Terre Haute, Indiana. In 1889 he was President of the American Association for the Advancement of Science. His printed contributions to science are numerous. He carries the degree of Ph. D. from the Ohio State University, and that of LL.D. from the University of Michigan.

There is a large amount of geographic information contained in the 136 quarto pages of the Report on the Sounds and Estuaries of North Carolina with reference to oyster culture, by Francis Winslow, U. S. Navy.* For the first time we have a description in detail of the outlying region and intricate coast of North Carolina. The areas, depths and lengths of the twelve sounds and numerous bays, rivers, inlets and creeks are minutely stated. It was in consideration of hydrographic data to be incidentally added to the archives of the Coast Survey, and for other reasons that a party was placed under the command of Lieut. Winslow in 1886, to aid in the development and definition of areas adapted to the cultivation of oysters in the sounds and estuaries of North Carolina. In the report above referred to, which has been recently issued, the character of the work and the results attained are stated. Within the brief period of less than three years nearly 600,000 acres of cultivable surface, capable of producing annually perhaps twice or thrice the product of the Maryland oyster beds in 1880 have been developed; fully 50,000 acres of which have already been taken up. The continued increase in the demand for oysters all over the country, and the continued diminution in the supply from the oyster-growing localities show that an increase of the productive area is

* U. S. Coast and Geodetic Survey: Bulletin No. 10.

not only desirable, but will prove a benefit to the people of the country at large. As Lieut. Winslow observes : " The ultimate results cannot be foreseen. But it is not unreasonable to predict that the few hundreds of dollars (\$1,786) expended on the investigation of Pamlico Sound and its tributaries will be the means, in the not distant future, of establishing an industry worth hundreds of thousands of dollars, employing many thousands of people, supporting many thousands more, and largely increasing the present supply of marketable oysters."

When Prof. J. Howard Gore of Columbian University began in 1885 a History of Geodesy, he found it very difficult at any time to be sure that the literature regarding the operations of a given period had been exhausted. So he deemed it best to collect titles as well as the works themselves. The various libraries in America were searched, and during two trips to Europe nearly every facility there was exhausted. Catalogues of libraries, however small, bibliographies of exact sciences, biographies of mathematicians, and trade lists of antiquarian books were carefully examined. In addition, a circular letter with an appended list of all his known works was sent to every living mathematician whose address could be obtained. The most notable accessions thereby secured were contributed by Col. John Herschel, R. E., who sent a manuscript supplement to his contribution to pendulum bibliography which was published in "Operations of the Great Trigonometrical Survey of India," Vol. V. This manuscript was found to contain seventy-two new titles.

The results of Prof. Gore's researches are embodied

in *A Bibliography of Geodesy*, a quarto volume of 200 pages, double columns; being Appendix No. 16 of the Report of the United States Coast and Geodetic Survey for 1887, just issued from the press. When it is announced that this work contains approximately 7,000 titles, it need not be added that it is a most notable bibliography. The author disclaims adherence to "all the refinements of bibliographic science," but nevertheless the work has been exceedingly well done. The insertion after the title of each work, of the name of the owner, or the depository where found is a feature that will be appreciated by those who have occasion to consult its pages. The claim made by Mr. Thorn in the Introduction that it is "the first work of its kind" will hardly stand. Prof. Gore himself cites other titles in his *Bibliography*.

It may be added that various overtures were made by foreign institutions desiring to publish this bibliography, but Prof. Gore having proffered the manuscript to the Coast Survey as the recognized American bureau of geodesy, the Superintendent gladly availed himself of the privilege of its preservation and publication.

CONGRESS OF THE THREE AMERICAS.—The gathering of the representatives of American nations at Washington on the 2d of October is an event of far reaching importance. Invitations have been sent to all the governments south of the United States, in pursuance of an Act of Congress approved May 24, 1888, by the terms of which the President is "requested and authorized to invite the several Governments of the Republics of Mexico, Central and South America, Hayti, San Domingo, and the Empire of Brazil to join the United

States in a conference to be held at Washington, in the United States, at such time as he may deem proper, in the year eighteen hundred and eighty-nine, for the purpose of discussing and recommending for adoption to their respective Governments some plan of arbitration for the settlement of disagreements and disputes that may hereafter arise between them, and for considering questions relating to the improvement of business intercourse and means of direct communication between said countries, and to encourage such reciprocal commercial relations as will be beneficial to all and secure more extensive markets for the products of each of said countries."

It is also provided in the act referred to that, in forwarding the invitations to the said governments, the President of the United States shall set forth that the conference is called to consider:

First. Measures that shall tend to preserve the peace and promote the prosperity of the several American States.

Second. Measures toward the formation of an American customs union, under which the trade of the American nations with each other shall, so far as possible and profitable, be promoted.

Third. The establishment of regular and frequent communication between the ports of the several American States and the ports of each other.

Fourth. The establishment of a uniform system of customs regulations in each of the independent American States to govern the mode of importation and exportation of merchandise and port dues and charges, a uniform method of determining the classification and valuation of such merchandise in the ports of each coun-

try, and a uniform system of invoices, and the subject of the sanitation of ships and quarantine.

Fifth. The adoption of a uniform system of weights and measures, and laws to protect the patent rights, copyrights, and trade-marks of citizens of either country in the other, and for the extradition of criminals.

Sixth. The adoption of a common silver coin, to be issued by each Government, the same to be legal-tender in all commercial transactions between the citizens of all of the American States.

Seventh. An agreement upon and recommendation for adoption to their respective Governments of a definite plan of arbitration of all questions, disputes, and differences that may now or hereafter exist between them, to the end that all difficulties and disputes between such Nations may be peaceably settled and wars prevented.

Eighth. And to consider such other subjects relating to the welfare of the several States represented as may be presented by any of said States which are hereby invited to participate in said conference.

In the letter sent out to the diplomatic representatives of this country in the countries named, the Secretary of State says: "I have to call your particular attention to the scope and object of the conference suggested, which, as will be observed, is consultative and recommendatory only. The proposed conference will be wholly without power to bind any of the parties thereto, and it is not designed to affect or impair in any degree the treaty relations now existing between any of the States who may be represented. The topics for discussion and deliberation are manifestly of profound importance, and it is believed that a friendly and frank exchange of views in re-

lation to these subjects will be of practical use, and by mutual enlightenment will materially promote that expansion and intimacy of social and commercial relations which must be fruitful of blessings to all concerned.

"Certain topics are suggested as proper subjects for a comparison of views, but the field is expressly left open to any participant State to bring before the conference such other subjects as may appear important to the welfare of the several States represented.

"By direction, therefore, of the President of the United States, and in his name, you will tender to the Government of —— a cordial invitation to be represented by such number of delegates as may seem to it convenient, at the international conference to be convened as aforesaid in the city of Washington, on Wednesday, the 2d day of October, 1889, it being understood however that in the disposition of questions to come before such conference, no State shall be entitled to more than one vote, whatever be the number of delegates it may send."

Letters of acceptance have been received from the Governments of the Argentine Republic, Bolivia, Brazil, Chili, Columbia, Costa Rica, Equador, Guatemala, Hayti, Honduras, Mexico, Nicaragua, Paraguay, Peru, Salvador, Uruguay and Venezuela.

The Government of Santo Domingo declines to send delegates. The delegates to the conference on the part of the United States are John B. Henderson of Missouri; Cornelius N. Bliss of New York; Clement Studebaker of Indiana; T. Jefferson Coolidge of Massachusetts; William Henry Trescott of South Carolina; Andrew Carnegie of Pennsylvania; Morris M. Estee

of California; John F. Hanson of Georgia; Charles R. Flint of New York; and Henry G. Davis of West Virginia.

The proceedings of the conference will be mainly in the English and Spanish languages, although if the rule of similar bodies is followed, the representative of any government will make his motions and propositions in his native language on the theory that he can thereby better express the finer shades of meaning than in an unfamiliar tongue. Then translations will be made into English. The proceedings are to be printed by the Public Printer in the English, Spanish and Portuguese languages. This will provide for every body concerned except Hayti, whose language is French.

The second proposition, although surrounded by almost insuperable difficulties, is probably the most important. The tariffs in each country are varying and conflicting, so that possibly the only way of surmounting the numerous obstacles presented will be by negotiating reciprocity treaties, whereby products peculiar to one country may be admitted free into the others.

The adoption of silver coin to be a common legal tender (sixth proposition) is not regarded as of vital importance. If the markets for our products in South American countries, and the markets for South American products in the United States are opened, commercial transactions will be so enlarged that New York will take the place of London in the settlement of balances in our currency without the aid of a common coin.

Mr. Charles A. Flint has recently made some statements* as to the commercial condition of the countries

*Address before the Merchants' Club of Boston.

south of us, which aid considerably in estimating the importance of successful results from the proposed conference. 1. The population is about 50,000,000. 2. The aggregate foreign trade for 1888 valued in United States gold coin was about \$1,200,000,000, of which our share was \$240,000,000. 3. We bought of them \$181,000,000, and sold to them \$69,000,000. 4. During the past twenty years our purchases from those countries have increased \$78,000,000, and our sales only \$12,000,000.

Before entering upon the discussions of the convention it has been wisely concluded to familiarize the delegates with the country by a personal inspection of our commercial and manufacturing centres. To this end they will leave Washington on the day following the opening for an extended tour through the eastern, northern, and western States, which will probably consume the time till November 14. The tour through the Southern States will be deferred until later in the season when the winter hotels are open. It is expected that the entertainment of the guests at points of debarkation will be provided by the localities favored. Numerous requests have been received at the Department of State, accompanied by liberal proffers from municipalities, boards of trade, manufacturers and others. No limit of time has yet been indicated, but it is probable that the congress will remain in session several months.

INTERNATIONAL MARINE CONFERENCE.—Under the provisions of "An act providing for an international marine conference to secure greater safety for life and property at sea," approved July 9, 1888, the President

of the United States was authorized to invite the government of each maritime nation to send delegates to a maritime conference, and to appoint seven delegates on the part of the United States.

These preliminary requirements have been complied with, and the following countries have thus far accepted invitations to participate: Great Britain, Germany, France, Italy, Denmark, Russia, Belgium, Mexico, Brazil, Chili, Costa Rica, Guatemala, Venezuela, Hawaii, China, Japan, The Netherlands, Nicaragua, Spain, Sweden and Norway, Uruguay and Honduras. The United States will be represented by a board of seven persons, and it is expected that the larger Powers will have the same number of representatives. The smaller countries, it is thought, will generally be represented by their Ministers here, assisted by one or more experts in the subjects before the conference. The American delegates are Rear Admiral S. R. Franklin; W. P. Sampson, Commander U. S. Navy; S. I. Kimball, Superintendent Life Saving Service; James W. Norcross, Master Mariner; John W. Shackford, Master Merchant Marine; William W. Goodrich, Counsellor-at-Law, and C. A. Griscom, President International Navigation Company.

The conference is to meet in Washington on the 16th of October.

It is declared in the act: "That it shall be the object of said marine conference to revise and amend the rules, regulations and practices concerning vessels at sea, and navigation generally, and the International Code of Flag and Night Signals; to adopt a uniform system of marine signals, or other means of plainly in-

dicating the direction in which vessels are moving in fog, mist, falling snow, and thick weather, and at night ; to compare and discuss the various systems employed for the saving of life and property from shipwreck ; for reporting, marking and removing dangerous wrecks or obstructions to navigation ; for conveying to mariners and persons interested in shipping, warnings of approaching storms, of dangers to navigation, of changes in lights, buoys, and other day and night marks, and other important information ; and to formulate and submit for ratification to the governments of all maritime nations proper international regulations for the prevention of collision and other avoidable marine disasters.

The American delegates (with the exception of Mr. Griscom) convened under instructions from the Secretary of State, and in April last formulated a detailed programme of subjects to be considered, for transmission to the several Powers. The following is the order :

General Division 1. Marine signals or other means of plainly indicating the direction in which vessels are moving in fog, mist, falling snow and thick weather, and at night. Rules for the prevention of collisions and rules of the road.

1. Visibility, number, and position of lights to be carried by vessels : (a) Steamers under way. (b) Steamers towing. (c) Vessels under way, but not under command, including steamers laying cable. (d) Sailing vessels under way. (e) Sailing vessels towing. (f) Vessels at anchor. (g) Pilot vessels. (h) Fishing vessels.

2. Sound signals ; their character, number, range, and position of instruments : (a) For use in fog, mist, falling

snow, and thick weather; as position signals for steamers under way; for steamers towing; for sailing vessels under way; for sailing vessels towing; for vessels at anchor; for vessels under way but not under command, including steamers laying cable. (b) For use in all weathers as helm signals only; for steamers meeting or crossing; for steamers overtaking; for steamers backing. (c) Whether helm signals shall be made compulsory or remain optional.

3. Steering and sailing rules: (a) Sailing vessels meeting, crossing, overtaking, or being overtaken by each other. (b) Steamers meeting, crossing, overtaking, or being overtaken by each other. (c) Sailing vessels meeting, crossing, overtaking, or being overtaken by steamers. (d) Steamers meeting, crossing, overtaking, or being overtaken by sailing vessels. (e) Special rules for channels and tide-ways, where no local rules exist. (f) Conflict of international and local rules. (g) Uniform system of commands to the helm. (h) Speed of vessels in thick weather.

General Division 2. Regulations to determine the sea-worthiness of vessels. (a) Construction of vessels. (b) Equipment of vessels. (c) Discipline of crew. (d) Sufficiency of crew. (e) Inspection of vessels. (f) Uniform certificates of inspection.

General Division 3. Draft to which vessels should be restricted when loaded. Uniform maximum load mark.

General Division 4. Uniform regulations regarding the designating and marking of vessels. (a) Position of name on vessel. (b) Position of name of port of registry on vessels. (c) Size of lettering. (d) Uniform system of draft marks.

General Division 5. Saving life and property from shipwreck. 1. Saving of life and property from shipwreck at sea. (a) Duties of vessels after collision. (b) Apparatus for life saving to be carried on board ship. (c) The use of oil and the necessary apparatus for its use. (d) Uniform inspections as to b and c. 2. Saving of life and property from shipwreck by operations from shore. (a) Organization of, and methods employed, by life-saving institutions. (b) The employment of drilled and disciplined crews at life-saving stations. (c) The maintenance of a patrol upon dangerous coasts by night, and during thick weather by day, for warning off vessels standing into danger, and for the early discovery of wrecks. (d) Uniform means of transmitting information between stranded vessels and the shore. (e) Lifeboats, life-saving apparatus and appliances. 3. Official inquiries into causes and circumstances of shipwrecks and other casualties.

General Division 6. Necessary qualifications for officers and seamen, including tests for sight and color blindness. (a) A uniform system of examination for the different grades. (b) Uniform tests for visual power and color blindness. (c) General knowledge of methods employed at life-saving stations. (d) Uniform certificates of qualification.

General Division 7. Lanes for steamers on frequented routes. (a) With regard to the avoidance of steamer collisions. (b) With regard to the safety of fishermen.

General Division 8. Night signals for communicating information at sea. (a) A code to be used in connection with the International Code Signal book. (b) Or a supplementary code of limited scope to convey infor-

mation of special importance to passing vessels. (c) Distress signals.

General Division 9. Warning of approaching storms. (a) The transmission of warnings. (b) The uniformity of signals employed.

General Division 10. Reporting, marking, and removing wrecks or obstructions to navigation. (a) A uniform method of reporting and marking dangerous wrecks and derelicts. (b) The division of labor, cost, and responsibility among the several maritime nations, either by geographical apportionment or otherwise, of the removal of dangerous derelicts, and of searching for doubtful dangers with a view of removing them from the charts.

General Division 11. Notice of dangers to navigation. Notice of changes in lights, buoys, and other day and night marks. (a) A uniform method of taking bearings, of designating them (whether true or magnetic), and of reporting them. (b) A uniform method of reporting, indicating, and exchanging information by the several maritime nations—to include the form of notices to mariners. (c) A uniform method of distributing this information.

General Division 12. A uniform system of buoys and beacons. (a) Uniformity in color of buoys. (b) Uniformity in numbering of buoys.

General Division 13. The establishment of a permanent international maritime commission. (a) The composition of the commission. (b) Its powers and authority.

The board has sent out letters to many sources, asking for information on the subjects to be considered, and

bundles of it have been received from the Light-house Board and the Chief Signal officer of the army.

The proceedings of the conference will be in the English language, but representatives will make their motions and propositions in their own language.

The programme proposed is not binding upon the conference, but probably will be adopted. The act authorizing the conference expressly forbids the consideration of commercial matters.

The following named nations have declined to participate in the proceedings of the conference: Greece, Roumania, Liberia, Peru, Paraguay and Colombia.

The claim is made, and probably not contested, that the Maritime Exchange, of New York, has the honor of originating this remarkable conference. It formulated the bill and urged its passage in Congress, and furthermore, when Great Britain at first declined to come into the conference, brought about a compromise on certain points, so that Great Britain consented to send delegates.

GREAT CIRCLE SAILING.—The actual state of the science of great circle sailing is presented in a recent publication of the U. S. Hydrographic office.* It consists of an exposition of graphical and analytical methods embodying cardinal principles relating to the great circle, as applied to navigation, and gives publicity for the first time to several of the most convenient and useful methods yet devised. The work is regarded as of high importance.

*The development of great circle sailing, by G. W. Littlehales. Under direction of G. L. Dyer, Lieut., U. S. N., Washington, 1889.

HOPE BANK AND RUM CAY.—Capt. Z. L. Tanner in his report of the work of the U. S. Fish Commission Steamer *Albatross* for 1886, just published, gives a narrative of his search for the supposed Hope Bank, which has occupied a position on Admiralty Charts in latitude $41^{\circ} 29' 28''$ N., and longitude $63^{\circ} 17'$ W. The cruise was made at the suggestion of Commander J. R. Bartlett, late Hydrographer, U. S. N., "for the purpose of determining the existence, and if possible the character of certain banks which are believed by some to exist, but which so far have not been properly examined."

The first soundings began at latitude $40^{\circ} 14'$ N., longitude $65^{\circ} 56'$ W., in 2,224 fathoms. The line was carried to the eastward to latitude $40^{\circ} 20'$ N., longitude $64^{\circ} 54'$ W., in 2,575 fathoms, thence to the position assigned to Hope Bank, where eleven soundings were taken at intervals of five miles, the depths varying from 1,930 to 2,069 fathoms. At the position assigned to the Bank there was found a depth of 1,969 fathoms! The *Albatross* then proceeded to St. Johns, Newfoundland, and on the return voyage additional soundings were taken in depths varying from 1,644 to 1,943 fathoms to the northward of those taken on the outward trip, demonstrating beyond a doubt that no shoal or bank exists on the ground covered. Subsequently a line of soundings was run to the westward to George's Bank, without finding any indications of shoal water to the eastward of it.

Capt. Tanner assigns the following reasons for the hitherto supposed existence of the bank: "Reference to the chart (H. O. Chart 21a) will show its assigned position to be near the northern edge of the Gulf Stream,

where its deep blue waters with temperatures above the normal and high specific gravity, impinge upon the colder green water of the Arctic current. The first sight of this green water on emerging from the Gulf Stream gives one the impression that he has suddenly struck soundings. The bank once placed on the chart, the navigator who found himself in green water anywhere in that region during foggy weather, or when from any cause he was uncertain of his position, would conclude at once that he was in shoal water, and locate himself in the position assigned to Hope Bank. The difference in color and specific gravity between the waters of the Gulf Stream and the region adjacent varies with the seasons, and is more marked during summer and autumn when the fresh water from melting ice finds its way from the Arctic. The navigator passing over the region had neither time nor the means at hand for satisfactory investigation; therefore, he was forced to judge from appearances, which, we have shown, are deceptive."

In this same report will be found a sketch of Rum Cay, one of the Bahama group, probably identical with Santa Maria de la Concepcion, the second island touched at by Columbus, by Lieut. Commander James M. Forsyth, U. S. N., a native of the island. It is replete with interesting facts and reminiscences.

IRRIGATION.—Aside from the monthly reports of surveying parties scattered in various parts of the west, southwest and on the Pacific slope, there is nothing new in the matter of the irrigation of arid lands. A committee of the United States Senate, accompanied by Major Powell, is engaged in an extensive tour over

a large part of the western territory, and the newspapers of that region are loaded with irrigation literature. The last appropriation of a quarter of a million dollars has been apportioned between the topographic survey (\$120,000), the hydrographic survey (\$32,000), and the engineer survey (\$76,000). Capt. Clarence E. Dutton, U. S. A., is in charge of the engineering and hydrographic surveys, and Prof. Almon H. Thompson has charge of the topographic survey. That irrigation is now a matter of serious concern and that large sums of money will be expended upon it—and probably wisely—there cannot be a shadow of doubt. But more will be known about it after the next Congress convenes. Meanwhile surveys and maps are being made, gauging stations established, and lakes scheduled preparatory to their selection and withdrawal for use as reservoir sites.

The latitudes and longitudes of certain localities in Missouri, Kansas and New Mexico were determined in 1885-86 in connection with the geographic work of the Geological Survey. The names of these localities are Oswego, Elk Falls, and Fort Scott, in Kansas; Springfield and Bolivar, in Missouri; and Albuquerque in New Mexico. Mr. Robert S. Woodward has collected and discussed the results of this work in a recent Bulletin* of the U. S. Geological Survey. The same writer has contributed to the Survey a series of mathematical formulas and tables designed to facilitate the construction and use of maps.† In this connection may be mentioned Mr. Schott's report on heights from geodesic leveling between Mobile and New Orleans, being Appendix No. 9 of the

*Bulletin No. 49.

†Bulletin No. 50.

Report of the United States Coast and Geodetic Survey for 1887, just issued. Other Appendices of this Report are: Fluctuations in the level of Lake Champlain and mean height of its surface above the sea; and the magnetic work of the Greely Arctic expedition; both by Mr. Schott; and Mr. Henry Mitchell's discussion of the movements of sands at the eastern entrance of Vineyard Sound.

THE ECLIPSE, 1889.—The United States Government will send an expedition to the west coast of Africa to observe the solar eclipse to occur December 21–22. The Navy Department has appointed a commission composed of Capt. R. L. Phythian, superintendent of the Naval Observatory, Simon Newcomb and Asaph Hall to devise a plan and make recommendations. The first step taken by this commission was to communicate with the United States consular officers on the coast of Africa to ascertain the usual conditions of the weather in December. This information is important in determining the location of observing stations. It is preferred to have the stations on the coast, but if the conditions there are unfavorable for observing, the parties may be sent inland. An examination of the path or belt of the eclipse as charted in the Nautical Almanac shows that the Guinea coast is about the only place where an expedition could be sent with fair promise of success. The belt within which the eclipse will be total extends across the continent of Africa, and passing over the Atlantic Ocean just grazes the northeast coast of South America. There is an island off the coast of French Guiana almost in the centre of the belt, but the eclipse occurs there a

little after sunrise, when the conditions for observing will be unfavorable. The period of totality there is only about two minutes. On the Guinea coast the eclipse occurs between 12 and 3 o'clock.

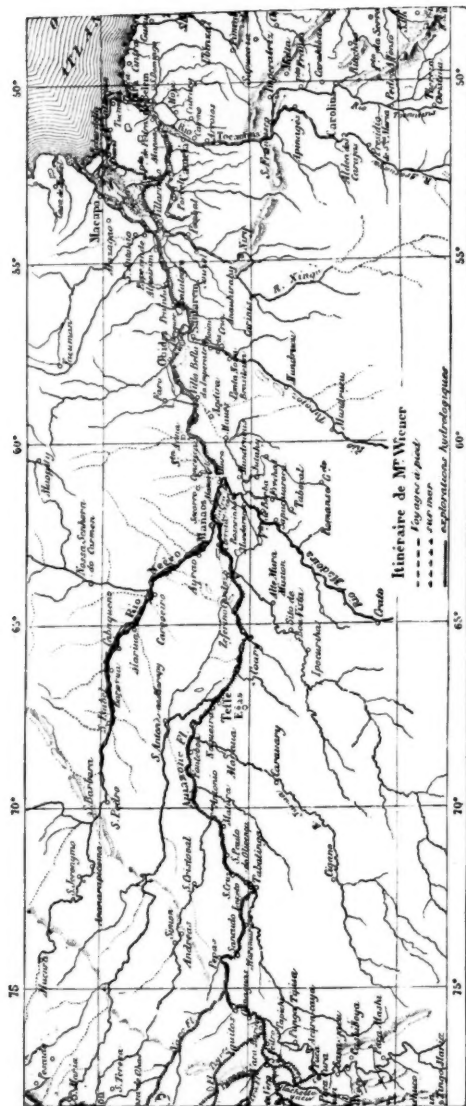
AN AFRICAN DISCOVERY.—Mr. Daniel F. Rankin, a private explorer, has made a very important discovery of a new opening in the Zambesi delta, connecting direct with the main stream of the Zambesi proper. The new opening is called the Chinge River, and is situated 45 miles south of the Quaqua River, on which Quillimane now stands. On the bar itself of the Chinge River at the lowest fall of the spring tides, there is a good three fathoms of water, with a channel some 500 yards wide and with good anchorage under shelter of the land. Mr. Ernest W. Smith, consul at Mozambique says: Hitherto commerce has been restricted and confined because of the difficulties attending the present route from the coast to the Zambesi, both at Quillimane and Inhemissengo, and it has been long felt that such a discovery was of the greatest necessity and importance to the development of the vast and rich regions drained by this waterway, and also of the greatest importance to the whole districts surrounding Lake Nyassa. At the present time all goods for the Zambesi River have to be brought up the Quaqua River (where there is only two and a half fathoms of water) to be landed at Quillimane for inspection at the custom house. From Quillimane the goods are shipped in lighters or canoes up the Quaqua River to a place called Mopea, four-and-a-half days' journey from Quillimane. At Mopea the goods are again unloaded and are

carried by natives for six miles through a swamp of two feet of water, to the Zambesi River, and from Senna or Tete, on the Zambesi, steamers connect with all points of importance in the lake districts.

By the new opening discovered by Mr. Rankin, vessels of from 500 to 600 tons burden can go direct from the sea to the Zambesi and thence to the Lake Nyassa districts without any change and with none of the bother now existing in connection with tides and seasons of the year.

The governor of the province, after having verified Mr. Rankin's discovery, requested the Portuguese home authorities to remove the seat of government of Quillimane from its present place on the Quaqua River, to the mouth of the Chinge River, and to order that henceforth all mail steamers call at the latter place instead of, as heretofore, at the former.

H.



THE AMAZON

FROM LE TOUR DU MONDE

